RAILROAD GAZETTE

FRIDAY, OCTOBER 7, 1898.

CONTENTS.

A Word to Subscribers.

Subscribers to the Railroad Gazette may observe that their papers are now tightly rolled, not folded. To remove the manila wrapper by tearing with the fingers or cutting with a paper knife is a little troublesome. A black thread is woven in the wrapper and extends longitudinally through it. If the edge of the wrapper at one end of this thread is seized and pulled with the thumb and finger the thread cuts the entire wrapper open and releases its inclosure. If then the copy of the Railroad Gazette is rolled in the hands the reverse way it will straighten out approximately flat and be in fair condition for comfortable reading. Since adopting for use this threaded wrapper, which entirely incloses the ends of the roll, losses of papers in the mail due to torn wrappers rarely occur, whereas they were frequent when the paper was folded. This explanation is made because of many letters received from subscribers who find difficulty in opening the roll, and who have not observed the black thread and the use of it.

Contributions.

Standard Bolt Heads and Nuts.

New York, Sept. 3, 1898.

To the Editor of the Railroad Gazette:

I notice in the table of Bolts and Nuts, page 372 of the "Car Builder's Dictionary," that the thickness of rough heads is in most cases less than the thickness of finished heads. This is quite correct, according to the basis of calculation given, namely: Thickness of rough head = one-half the distance between parallel sides of head; and thickness of finished head = diameter of bolt $-\frac{1}{16}$.

Will you kindly explain this seeming anomaly, as it appears to me that the rough head and rough nut should have the same thickness as is the case with the finished head and finished nut. I have seen the same peculiarity in other tables and should like to know how it originated and if it is a part of Sellers' standards. WM. COX.

William Sellers & Co., Incorporated.
Philadelphia, Sept. 28, 1898.

To the Editor of the Railroad Gazette:

The thickness of bolt heads and nuts may and does vary with the use they are to have. Thus a rough bolt head for timber is frequently made large and thin and a clamping nut that is frequently screwed tight and unscrewed is made much thicker than the rule for permanent fastening only. The thickness of the bolt head or the nut does not affect the wrench that turns either, and, therefore, does not affect their interchangeability. The original paper of 1864 and the report thereon will be found in the Proceedings of the Franklin Institute, April and December, Vols. 47 and 49, of 1864.

The finished head and nut were made the same thickness because they frequently alternate or were in close proximity, and custom had established that uniformity in height improved the appearance of finished work; also that the thickness of the nut should equal the diameter of the bolt, the latter probably to provide wearing surface for the thread, as a thickness of nut much less would break the bolt.

The rule for thickness of a rough bolt head was untrammeled by the considerations governing the finished head and nut, and, therefore, a thickness only sufficient to develop the strength of the bolt was provided by the rule. WM. SELLERS.

The Mexico, Cuernavaca & Pacific Railroad.

San Nicolo del Oro,
September 10, 1898.

To the Editor of the Railroad Gazette:

It is a surprise to find in Mexico railroad engineering, construction, equipment and operation of the highest order. The engineering feats of our railroads in the Rockies here find their full parallel, and nowhere is railroading in its general features carried to a higher degree of excellence. To appreciate the conditions in Mexico one must know something of the topography of the country. To enter or leave the City of Mexico it is necessary to ascend to a height of from 8,000 ft. to 10,000 ft. above sea level; and yet, in the comparatively short distance of 150 miles by airline either the Gulf of Mexico or the Pacific Ocean is reached. The country is exceedingly broken with high mountains, deep gorges or "barrancas," interspersed with fertile valleys. The greater difficulties lie on the Pacific side, and as a consequence there is as yet no direct connection between the Mexican capital and the seaports on the Pacific. On this side lies the great wealth of mineral that tempted the Spaniards, under the Conqueror, to untold feats of bravery and endurance, and on this side also a wealth of field and forest only awaits the approach of the "carmino de hierro" to bring to light the Eldorado.

When Maximilian selected his country home in the magnificent palace founded by Cortez in the beautiful valley at Cuernavaca, south of Mexico City, Austrian engineers were instructed to find a practical railroad route between these two points. They reported that such a line was not only impracticable, but impossible. It was left for an American railroad man, Col. J. H. Hampson, to prove the inaccuracy of that report. The Government wanted a railroad line from Mexico City direct to the port of Acapulco, passing over the almost impenetrable mountain ranges of the Sierra Madres. The road has passed not only the rugged slopes of the old Ajusco volcano and the Tres Marias Mountain into the beautiful valley of Cuernavaca, but has successfully scaled the mountain barrier that hid from the world the quaint old town of Iguala, where behind its natural barrier many a scheme of revolution was hatched; and the iron horse is now fairly on its way to the Balsas River, which marks the beginning of the next great ascent of 8,000 ft. over the wild and rugged Sierra Madre del Sur, with its precipitous and barranca-serried slope to the Pacific.

The scenery along this line equals anything on any of the famous scenic lines of the United States. The descent from Tres Marias unfolds a panorama of a hundred miles of mountain, valley, city and hacienda. The road may be traced for over 40 miles ahead, and the total fall in 36 miles is nearly one mile.

The next important engineering feat is the passage of the Cañon de Mano, a narrow, tortuous defile through the mountains north of Iguala. Here the road winds and turns from side to side in roadways cut from the solid rock or built in solid masonry under perpendicular precipices over 2,000 ft. high, through tunnels and over bridges, spanning the chasm that forms a foaming torrent in the wet season. One of these bridges is 300 ft. long, 125 ft. high, and located in a double reverse curve. The engineering difficulties at this point were enormous at places, the engineers having to be let down by ropes from above.

This road is laid with 76-lb. English rails, American ties, tie plates and spikes; standard gage. The culverts are of masonry; the bridges iron, of American make. The rolling stock is also American make, cars standard capacity, locomotives 110 tons, passenger equipment superb. Curves are compensated on grades, 12° maximum curvature, maximum capacity of locomotives on heaviest grades four box cars loaded to capacity. The road is ballasted with lava from the old Ajusco volcano and with broken stone. The former is the best ballast material in the world. The officers, foremen, contractors, engineers, and conductors are American, all the other employees Mexican. The road may be accepted as an advanced type of the best roads in this Republic.

The Government has an Inspector of Railroads, who inspects and receives a road before it is permitted to begin operations, and the Government establishes the minimum specifications.

Our American railmakers should look to their laurels, as the majority of rails used in this country are of English make.

It will be but a short time before Mexico has one or more lines from the Capital to the Pacific Ocean, and the Republic will then enter on an era of prosperity unsurpassed anywhere in the world, for nowhere can be found richer lands or more charming climate nor richer mineral deposits than among these mountains bordering the Pacific. H. W. REED.

The Kinetic Motor.

To the Editor of the Railroad Gazette:

Your correspondent, T. D., seems to be anxious to assist some one to earn that $1,000, and we will help him by considering his remarks successively:

1. He acknowledges the simplicity of the locomotive. Now our motor is only a locomotive to which a condenser and other features bearing on economy and the avoidance of the objectionable characteristics of the usual locomotive have been added, and which in no wise complicate the machine, so far as the machinery goes. As for the water carried, with us it is carried hot, instead of cold, the contained heat taking the place of the fuel carried by the usual locomotive. We know, however, that we are not obliged to take on fresh supplies of water more frequently than is done by any locomotive of the same power.

2. His view of the durability is, of course, correct.

3. As to reliability, we can only point to what we have so far done with the motors we have in operation, and to the success the French are having with fireless locomotives, claiming, at the same time, that our improvements have bettered the conditions. The degree of reliability turns on the question of the amount of steam that can be generated from the materials carried, that is to say, looking on fuel as a vehicle for heat in one case, and the hot water in the other, in addition to the fact that in our case we generate and use the steam more economically.

4. If T. D. should be refused the right to operate a railroad because of the presence of those features he designates as "non essential," we think he would find their consideration very essential. There are many features, that do not in any way bear on the design or even the operation of the machinery of a railroad, that are very essential in the consideration of the merits of any system.

5. Under this head we come to a point on which, like religion and politics, there is, and always will be, endless discussion and difference of opinion. There would appear to be no doubt that the cost of operation of any system must be ascertained by taking all expenses that are necessarily paid to keep the cars running; and yet there are many sums paid out that are extremely difficult to classify. Consider two roads, one of which, by reason of physical conditions, cost double the other to construct, hence the interest account is double; yet the amount of fuel, oil, labor charges, etc., may be the same on both lines. This is exemplified in a comparison between the underground trolley lines of New York City and the overhead trolleys of Philadelphia. In these cases we have no true statement of the cost of repairs and renewals or losses by leakage, this last being a question concerning which all electric men are very reticent and one from which the Kinetic motor is practically free.

Mr. T. D.'s fear of the practical difficulties of carrying a thousand pounds of water is amusing. Has he considered that a locomotive drags after it many thousand pounds of water as well as fuel, and as a dead weight, while the weight on the Kinetic motor is at least of use in assisting in tractive qualities?

KINETIC MANUFACTURING COMPANY.

New York, Oct. 4, 1898.

To the Editor of the Railroad Gazette:

In your last issue an article appears on the Kinetic motor in which the writer seems to have a misapprehension of the motor.

(1) He admits that the locomotive is practically the simplest kind of mechanism for traction purposes; the Kinetic motor mechanism is strictly that of a locomotive, with some simplifications. The receivers or boilers under the cars, where the steam, in the form of superheated water, is stored, are lagged with asbestos; so that, although the temperature of the water is over 387° Fahr., very little heat can be felt when the hand is placed on the lagging. While the auxiliary firebox under the motor receivers makes up for this small radiation of heat, it also keeps the water at the same pressure and temperature while the steam is being drawn off. Thus, while in the strictly fireless locomotive the pressure reduces as the steam is used, in the Kinetic it does not; and at any time the Kinetic has the same pressure of steam as it had when the charge was first put in, thus exerting its full horse-power whenever required.

(2) As to the durability, that is, of course, a matter of strength and of quality of material used.

(3) As to reliability, the Kinetic motor being locomotive mechanism, will be as reliable as a locomotive, and will not be dependent on a power house while running, as electric motors are.

(4) Freedom from offensive features means no smoke, no show of steam, no noise from exhaust as by locomotives, or buzzing and grinding of electric motors and gear wheels. And as to being an "automobile which moves with a wabbling motion and starts like a grasshopper," the Kinetic cannot be accused of that as anyone who has ever ridden on one can vouch for.

(5) As to economy, a stationary boiler is the most economical method of generating steam. Here is where the Kinetic motor gains over the locomotive. In transferring the hot water from one boiler to another very little loss is encountered. When the steam is given to the Kinetic motor it is at the point corresponding to the power house engine of an electric system, thus eliminating all the losses from generators, leakage of wires and power necessary to force the current through the wires.

The Kinetic has the advantage over compressed air in that it has a constant pressure, and a much lower one, needing no powerful air compressors. As to the practical difficulties of carrying 1,000 lbs. of water 20

miles, would suggest that they amount to the same as carrying five men, each weighing 200 lbs., which is no great obstacle. T. J. M.

Compressed Air on New York Street Railroads.

Present indications make it safe to state that early next year (probably by the end of February), 22 cars worked by compressed air will take care of the passenger traffic between the ferry at West Twenty-third street and the one at East Thirty-fourth street, by way of Twenty-eighth street and Twenty-ninth street, and of much of the travel between West Twenty-third street and the Grand Central Station.*

The compressing station at West Twenty-fourth and West streets is being built, and the machinery formerly at the 146th street station has been, or is now being, placed in the West Twenty-fourth street building, which has over its door a sign bearing the name "The American Air Power Company." The foundation has been finished for the 350 h. p. horizontal compressor, which will be transferred from the uptown station. This will be driven by a Green-Wheelock engine. Work is in progress on the piling and the foundation for a 1,000 h. p. Ingersoll-Sergeant four-stage single-acting compressor, provided with intercoolers between each pair of cylinders, and a final cooler after the fourth stage cylinder. The air cylinders are to be vertical and will be set underneath the engine, which is a vertical cross-compound condensing Reynolds-Corliss engine, built by the E. P. Allis Company. The steam for these engines will be supplied by four Babcook & Wilcox boilers of 250 h. p. each. These compressors will have a capacity of compressing 150 cu. ft. of free air per minute per horse power at a terminal pressure of 2,200 lbs. per sq. in.

Some of the equipment for these cars will be made at the Twenty-fourth street station. The cars will be built from the general design of those cars, a few of which have been used on the Lenox avenue line, and were minutely described in our issue of Dec. 31, 1897. One of the commendable features (from the operating standpoint) in this design is the single handle controller, by means of which the motorman will be enabled to regulate the movement of the car as easily as the motorman on an electric car. One variation from the former design, however, will be in the arrangement of the bottles, or storage reservoirs, in the modified form, to run the entire length of the car and to have a combined storage capacity of 40 cu. ft. A hot water storage tank, with a capacity of 600 lbs. of water, will be placed under the cars, as in the previous design. Each car will be expected to make a run of 20 miles on a single charge, with some reserve at the end of the trip.

A new type of Brill car bodies will be used, and this company will also make the trucks from the Hoadley-Knight designs. Each seat will be provided with a signal button, by means of which connections will be made with compressed air leading to the motorman's signal. By means of this novel device each passenger will be enabled to signal for stopping the car. It will be the aim of the engineers to make these cars run as quietly as possible, and to aid in this paper wheels will be used on all the cars.

Trainloads on the Northern Pacific.

We called attention two weeks ago, in a brief review of the annual report of the Northern Pacific Railway, to certain remarkable results that have been reached in working that road in the way of increasing trainloads, and thus reducing cost of working. As every well informed railroad man knows, these results are the fruit of a good many years of systematic effort on the part of those who have been in control of the Northern Pacific, and they are not the results of any occult or mysterious influence which has been recently injected into the methods of operation. In other words, the whole process has been purely scientific and was long ago conceived, and has been intelligently carried out. In the last annual report there are some very important statements and figures bearing on this matter, and we reprint some of them below.

The statement following, headed "Comparison of Train Tonnage," shows the engine rating upon the various divisions prior to 1893, in 1897, in 1898, and the intended future rating. The differences are very startling and are not wholly attibutable to grade revision, a portion of the improvement being due to the introduction of new power, and the reassignment of power to those districts where it can be used most effectively. The establishment of a record has proved a great incentive to the entire force—officers and men alike—to improve upon the past record and establish a new and higher one.

The object of our grade revisions has been to reduce the cost of transportation by effecting a reduction in train miles or the movement of the tonnage of the road in larger trains, fewer in number, and to so adjust the grades of the various districts and divisions as to make it practicable to haul trains of practically uniform and maximum weight over considerable sections of the road, and thus avoid the detentions and cost incident to breaking up and rearranging trains. This work, as undertaken, was conceived about eight years ago, and has been nearly carried to a very successful conclusion.

Comparison of Train Tonnage.
E=Eastbound. W= Westbound.

Division and District.	Prior to 1893.		1897. Tonnage.		1898. Tonnage.		Future. Tonnage.	
Lake Superior, Second	650	E	1,350	E	1,350	E	1,350	
		W	1,350	W	1,350	W	1,350	
Minnesota, Second	700	E	1,350	E	1,500	E	1,500	
		W	1,400	W	1,500	W	1,500	
Manitoba, First	800	E	1,050	E	1,500	E	1,500	
		W	1,050	W	1,350	W	1,500	
Dakota, First	840	E	1,350	E	1,350	E	1,350	
		W	1,200	W	1,200	W	1,200	
Dakota, Second	700	E	1,000	E	1,000	E	1,350	
		W	1,000	W	1,000	W	1,350	
Missouri, First	425	E	675	E	1,000	E	1,350	
		W	675	W	925	W	1,350	
Missouri, Second	425	E	715	E	875	E	1,350	
		W	750	W	875	W	1,350	
Yellowstone, First	625	E	1,200	E	1,250	E	1,500	
		W	850	W	875	W	1,350	
Yellowstone, Second	625	E	1,200	E	1,250	E	1,500	
		W	850	W	875	W	1,350	
Montana, First	E 1,000	E	1,500	E	1,500	E	1,500	
	W 650	W	1,000	W	1,000	W	1,000	
Montana, Second	E 375	E	1,000	E	1,000	E	1,200	
	W 750	W	1,000	W	1,000	W	1,000	
Rocky Mountain, First	E 400	E	1,000	E	1,200	E	1,200	
	W 875	W	1,050	W	1,050	W	1,200	
Rocky Mountain, Second	E 400	E	840	E	1,000	E	1,200	
	W 400	W	900	W	950	W	1,200	
Idaho, First	E 450	E	1,000	E	1,065	E	1,200	
	W 450	W	1,000	W	1,065	W	1,065	
Idaho, Second	E 525	E	900	E	900	E	1,200	
	W 640	W	875	W	900	W	1,200	
Idaho, Third	E 650	E	1,500	E	1,500	E	1,500	
	W 500	W	820	W	1,125	W	1,200	
Pacific, Ellensburg to Easton	594	E	900	E	900	E	1,000	
Pacific, Easton to Lester	810	W	900	W	1,225	W	1,225	
" Lester to Tacoma	E 405							
	W 810							
Pacific, Second	E 525	E	620	E	1,100	E	1,100	
	W 525	W	620	W	1,100	W	1,100	

The efforts of the past years to secure better loading of engines and cars have been continued, with a very fair degree of success, and the investigation of this subject, in connection with the revision and reduction of grades, has led to the purchase and use of engines of the heaviest type, and the incidental retirement of a large number of engines which were uneconomical and, indeed, obsolete. On June 30, 1897, the locomotive equipment list showed 582 engines assigned to service. During the year the following new locomotives have been purchased:

Number.	Type.	Weight on drivers.	Total weight.
18	10-wheel	112,000 lbs.	155,500 lbs.
18	10-wheel	126,000 lbs.	172,500 lbs.
7	10-wheel	131,800 lbs.	173,800 lbs.

Twelve second-hand locomotives were purchased from the Montana Union Railway. Of the 225 light 17x24 eight-wheel engines on the equipment list June 30, 1897, 95 have been retired, against which there was an addition of 55, making a net decrease of 40, thus leaving a total of 542 engines on the list of equipment June 30, 1898. It may seem that this diminution in the number of engines must have resulted in a reduction of the locomotive power, but owing to the fact that all of the new engines that have been purchased are heavy, and that those which they replace are light, the change has resulted in a material increase not only in the total weight of the locomotive equipment in service, but a still greater increase in the power pertaining to such equipment, as follows:

	June 30, 1897.	June 30, 1898.	Inc. or Dec.	% of Inc. or Dec.
Number of engines	582	542	D. 40	D. 6.9
Weight on drivers, lbs.	42,767,565	44,432,865	I. 1,665,400	I. 3.89
Weight of engines, lbs.	42,767,585	44,432,965	I. 1,665,400	I. 3.89

In order to arrive at a comparison of the power and working capacity of the engines included in the present equipment list and those in use a year ago the actual horse-power capacity has been determined from indicator cards taken under service conditions, and such power is not the maximum that the engines can develop under favorable circumstances, but that which they are capable of sustaining in service. The following statement shows the changes in horse-power capacity that have taken place during the year ending June 30, 1898, as compared with the previous operating or fiscal year:

	June 30, 1897.	June 30, 1898.	Increase.	% of Inc.
Number of road engines	505	460	*45	*8.9
Total horse-power	249,275	263,625	14,350	5.8

*Decrease.

Perhaps better and more satisfactory evidence of the fact that the capacity of locomotive equipment has been considerably increased during the past year is afforded by the following statement, showing a comparison of the number of tons hauled one mile by engines in actual service during the last six months of the fiscal years 1897 and 1898, respectively:

Month.	Engines in service.	Total engine miles.	Gross ton miles.	Gross tons per engine mile.	Per cent. of increase.	Total train miles.	Gross tons per train mile.	Per cent. of Inc.
January, 1897	415	1,032,272	404,904,864	392	....	673,832	600	....
January, 1898	318	941,535	445,812,610	474	20.92	656,258	679	13.16
February, 1897	404	906,464	388,018,256	401	....	626,687	619	....
February, 1898	317	963,729	479,737,277	497	23.94	675,588	710	14.70
March, 1897	418	1,174,448	505,094,098	430	....	785,143	643	....
March, 1898	356	1,187,729	603,148,482	508	18.14	842,067	716	11.35
April, 1897	406	1,105,917	501,273,832	453	....	833,191	601	....
April, 1898	370	1,129,927	588,386,087	521	15.00	808,596	727	20.96
May, 1897	400	1,163,648	547,068,316	470	....	889,390	615	....
May, 1898	381	1,195,195	631,249,041	528	11.00	870,917	724	17.70
June, 1897	395	1,148,932	550,206,873	478	....	874,141	629	....
June, 1898	379	1,163,423	606,323,736	521	9.00	868,663	698	11.00

As a matter of fact, 43 heavy engines replace 95 light ones.

A radical change in the method of operating motive power has taken place during the past year, in that engines are now run through over the entire divisions, instead of stopping at district terminals. This change has resulted in reducing the number of passenger engines in main line service about one-half, and saving considerable labor and expense at district terminals. It has also made it possible to discontinue the operation of some of the smaller district terminals, which has resulted in a considerable saving.

An entire redistribution of freight power has also been found desirable, owing to the introduction of new and heavy freight engines and the adaptation of the power relieved by them to the work on other divisions.

All of our new freight engines are compounds, and one-half of the passenger engines (Class "P"). They have proven effective, economical and satisfactory in every respect.

* For previous discussions of the route and equipment of this line see Railroad Gazette, May 13, p. 341; May 20, p. 363; June 24, p. 464, and Aug. 19, p. 595, all of the current year.

Freight Rates on Live Stock to St. Louis.

At the September meeting of the St. Louis Railway Club the principal address was one by Mr. Philip E. Hale, editor of the National Stock Reporter, on the St. Louis live stock market, as affected by freight rates. The receipts of live stock at the National Stock Yards, East St. Louis, last year, were 52,902 cars, and the Union Yards received about 8,000 cars. At Chicago the Burlington alone delivered nearly as many cars as were delivered by all of the roads at St. Louis; and Kansas City, according to Mr. Hale, also fares much better than St. Louis. Of the total receipts at these three cities and Omaha, last year, Chicago received 53.4 per cent., Kansas City 23.6, Omaha 11.2, and St. Louis 11.6. According to Mr. Hale this unfavorable position of St. Louis is due almost wholly to the "unfriendly" attitude of the railroads. From places half way between St. Louis and Kansas City, rates are more favorable to the latter than to the former. From points, say, 70 miles east of St. Louis, the rates are much more favorable to Indianapolis. From Pittsfield, Mo., the Wabash carries hogs to Buffalo, 731 miles, at 25 cents per 100 lbs., while to St. Louis, 138 miles, it charges 14.3 cents. The speaker went on to cite instances of this kind on nearly all of the roads. The Burlington makes the same rates per mile to the rival cities, but gives a much superior train service to Chicago. Going beyond the local field and into Texas, the St. Louis buyers "find plenty of trouble." Kansas City has an unjust differential in her favor. The live stock delivered at St. Louis pays $3,000,000 in freight bills yearly; if the railroads did the city justice, the freight bills would amount to $4,000,000. In spite of the disadvantages, the St. Louis cattle trade is growing, the bulk of the cattle from Texas coming there, notwithstanding the unfair rate.

There was no discussion on the paper. Whether the desired reductions would actually increase live-stock shipments to St. Louis, as compared with shipments to other cities, and to what extent competition of other railroads or differences in cost have justified the railroads in making tariffs on the basis now prevailing, were points which Mr. Hale passed over without discussion.

The Pekin-Hankow Railroad Contract.

Consul-General Goodnow has sent from Shanghai the text of the contract made between the Director-General of the Chinese railroads and the Belgian Syndicate (see Railroad Gazette Jan. 14, 1898, p. 31), for the construction of a railroad from Lou-kou-chiao to Hankow. The chief articles of the contract are given below:

The Government places the general direction of this enterprise in the hands of His Excellency Sheng-ta-yen.

The Director-General of Railroads, Sheng-ta-yen, and M. Hubert, the representative of the Belgian syndicate, undertake the construction of the railroad.

The decree authorizes the General Railroad Company to undertake the construction of the Lu-Han line, which covers a distance of about 1,300 kilometers.

The General Company having already a capital of 13,000,000 taels ($9,000,000) the Emperor informs the Viceroys of Pechili and of Hu-Kwang that the Director-General, Sheng-ta-yen, has contracted a European loan for the purpose of completing its construction. A general company has been formed to construct a railway between Lou-kou-chiao and Hankow, and a loan has been contracted in Europe by this company for the purpose of completing the enterprise.

Sheng Chuang-Houai is nominated the head of this company under the title of Superintendent of Railroads. As a result, the Viceroys of Pechili and of Hu-Kwang, with Sheng-ta-yen, in conformity with the imperial decree, decided to negotiate a foreign loan with interest at 5 per cent. This loan of $21,712,500, as stipulated in the preceding contract signed at Wuchang, will take the name of "the 5 per cent. Chinese railroad loan of 1898."

China cannot repay, wholly or in part, the capital borrowed before 1907; but after 1907 the repayments can be made at any moment, and, once that a repayment has been made the present contract is entirely nullified. The Belgian syndicate will designate the place in Europe where they will make the payments of interest, and will equitably designate the bankers who are charged with the payment and issue of scrip. The income of the railroad, after deducting working expenses and improvements, will be devoted at first to the use of the loan.

The net proceeds are to be remitted by the General Company to the Belgian syndicate, that they may be deposited in the Central Bank of Brussels or the one designated by the latter.

The General Company consents to give to the Belgian syndicate, under the form of a chief guaranty, the railroad line from Lu-kou-chiao to Hankow, with the rolling stock and lines of improvement.

As the Lou-Han line must be first completed on one side by the trunk line of Lou-kou-chiao to Pao-ting-fu (90 miles), and on the other side by the trunk line of Hankow to Sing-yeng (158.4 miles), the General Company will immediately proceed with the construction of these two trunk lines, and will furnish all the material for construction and rolling stock for the beginning of the trunk lines. Excepting the trunk line of Lao-kou-chiao to Pao-ting-fu, the construction of the entire Lou-Han line will be given by the General Company to the representative of the Belgian syndicate, who, acting for the General Company, will undertake the direction, supervise the construction, survey, make plans and estimates, undertake the work, order the ballast and materials for its carrying out. All the plans, estimates, projects, etc., must be submitted for approbation by the

Superintendent of the General Company. Excepting purchases made in Europe, which are paid directly by draft, all the expenses of the work, including transportation, etc., of the European staff engaged by the Belgian syndicate on account of the General Company, will be paid by the latter, in order that the Belgian syndicate will have no expenses to pay, and that it may devote all its efforts exclusively to forwarding the work, which must be completed throughout the entire line within three years.

For the work on the Hankau-Sing-yeng and Sing-yen-Pao-ting-fu trunk lines, the Russo-Chinese Bank and the other banks to be mentioned later must pay monthly to the General Company such sums as are necessary for its construction and expenses. These sums must be appraised in advance by the Belgian syndicate or by its representatives. . . . The profit from the sale of scrip being destined exclusively for the construction of the line from Hankow to Pao-ting-fu, the banks can therefore suspend payment if they discover that a single cent of this money has been diverted to other purposes, or that the General Company refuses to further authorize the Belgian engineers to direct the construction thereof. Should this construction not absorb the entire amount of the loan, the surplus will be returned to the General Company.

The Belgian syndicate engages to purchase, previous to the end of the year 1901, the remainder of the scrip for the sum of $14,185,500.

Excepting the material furnished by the Hanyang Iron Works, all the material necessary for the construction and exploitation line will be furnished by the Belgian syndicate.

Concrete Facing on a Sandstone Bluff.

Mr. Onward Bates, Bridge Engineer of the Chicago, Milwaukee & St. Paul, in a paper before the Western Society of Engineers, Sept. 7, described the work of facing with concrete a sandstone bluff at St. Paul, which is capped with an irregular broken ledge of limestone.

The main line of the Chicago, Milwaukee & St. Paul extends along the base of this bluff, and there was constant danger from rocks falling on the track, as the underlying sandstone disintegrated rapidly under the influence of the weather. No attempt was made to remove the projecting limestone rocks, but boulders, making the top of the wall 56 ft. high above the footing. This surface above and below the limestone ledge was covered with a facing of concrete averaging in thickness below the ledge 2 ft. 5 in., and above the ledge 3 ft. 2 in. No attempt was made to put in the concrete with a uniform slope, but it was fitted against the formation of the bluff.

The work has now been in place over a year and no faults have so far appeared in it. The total cost, including all charges for labor and materials, excepting freight on the latter, was $6,787.36, or $26.46 per lin. ft. Mr. Bates states that if the work were to be done again he would use concrete instead of brick for pilasters, as the concrete is equal in quality and less costly.

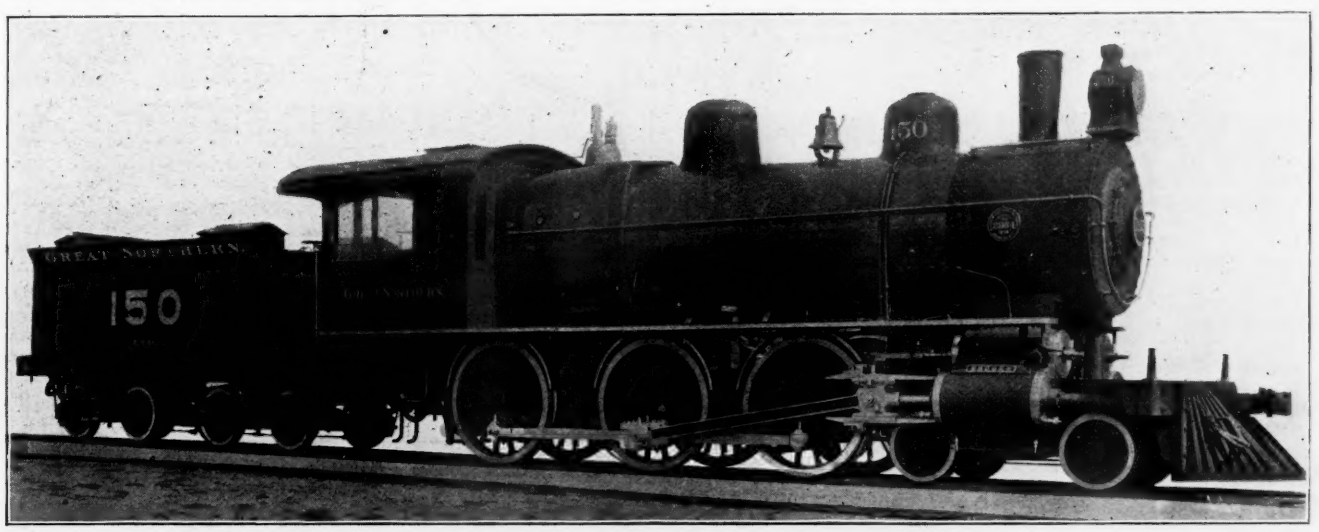


Fig. 1.—Ten-Wheel Passenger Locomotive, Great Northern Railway.
Built by the BROOKS LOCOMOTIVE WORKS, *Dunkirk, N. Y.*

Ten-Wheel Passenger Locomotives for the Great Northern Railway.

The Great Northern, in March last, placed an order with the Brooks Locomotive Works for eight heavy 10-wheel locomotives for use in passenger service, but the dimensions are so similar to those of some recent freight locomotives that it seems almost useless to attempt a comparison with passenger engines, although the builders claim that these are the heaviest passenger locomotives ever built. They have been in use about three months, and have lately been tested in both passenger and freight service, so that a consideration of their principal features will be of interest. The results of certain tests will be given in our next issue. The cylinders are 20 in. in diameter by 30 in. stroke, the driving wheels are 63 in. in diameter, and the total weight in working order is 166,000 lbs., the weight on the drivers being 129,500 lbs. The maximum tractive effort when cutting off at 20 in. is about 36,000 lbs., or 28 per cent. of the weight on the driving wheels.

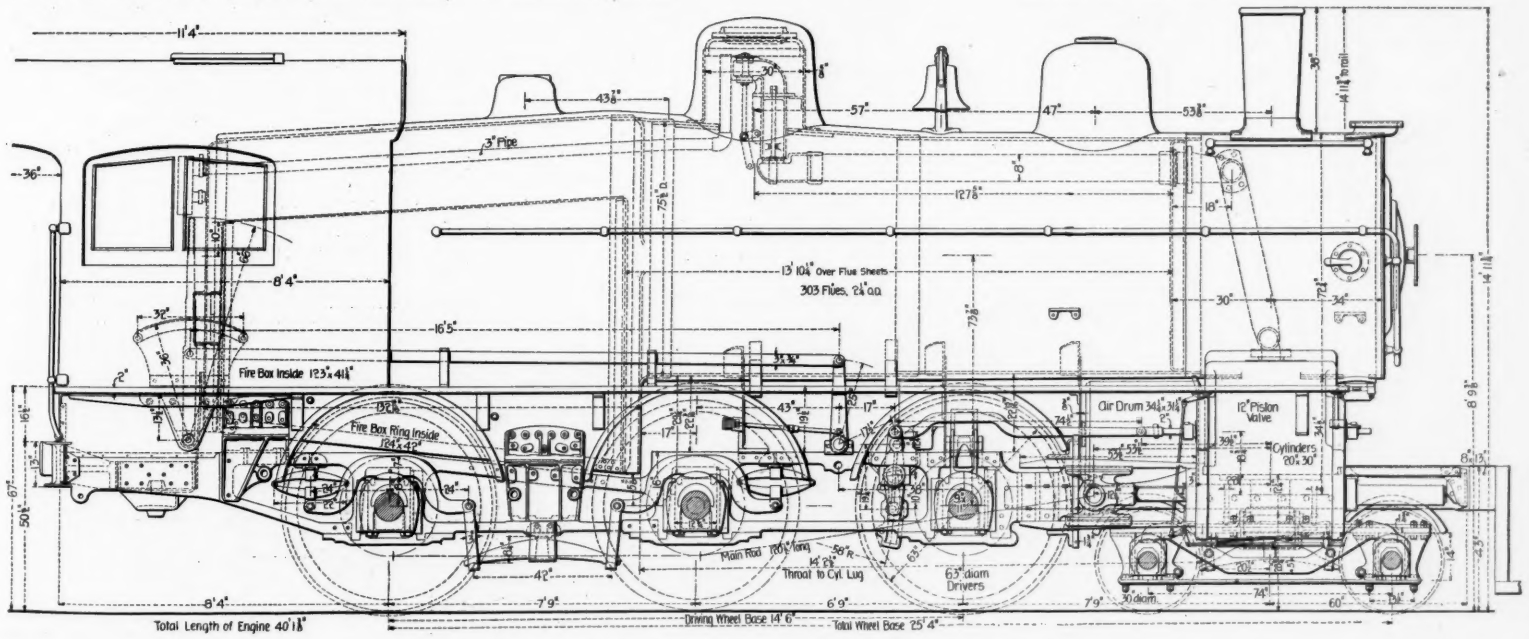


Fig. 2.—Elevation, Ten-Wheel Passenger Locomotive, Great Northern Railway.

The boiler is of the Player Belpaire type, 70 in. in outside diameter at the front end, and designed to carry a working steam pressure of 210 lbs. per sq. in. Some of the plates are of unusual thickness. Thus the front flue sheet is ¾ in., the firebox flue sheet ⅝ in., one cylinder course 1 1/16 in. and the other ¾ in. thick. Three pop valves are used, set at 212, 213 and 214 lbs. per sq. in. respectively. The heating surface of the tubes is 2,452 sq. ft., and that of the firebox 225 sq. ft., making a total heating surface of 2,452 sq. ft.; the grate area is 35.4 sq. ft. The firebox is large and placed wholly above the frames, with unusually large water spaces at the sides, front and back. This not only insures better circulation, but the stay-bolts can be made longer than usual, especially those in the top rows, thus reducing the liability of breakage. It will be noted that the horizontal boiler seams are sextuple riveted lap joints, which form is considered by the builders to be lighter and more flexible than the more common butt riveted seams; those circumferential seams which are subjected to the greatest stresses are triple riveted, while the others are double riveted lap joints. The smokebox is fitted with the latest form of spark arrester devised by Mr. J. Snowden Bell of Pittsburgh. This has been applied to a large number of recent locomotives, and has been found to give excellent results in improving the steaming qualities of the boilers, and in doing away with the sparks, thus fulfilling the requirements of the ideal spark arrester.

Some of the new features of the construction which were used on the Wisconsin Central engines need only be briefly mentioned. The frames are 5 in. wide throughout, excepting at the front and back ends, where the width is reduced and the depth increased. The front ends are connected by a heavy 13-in. channel, which forms a backing for the bumper beam, while the back ends are connected by two 13-in. channels of lighter section placed back to back with a vertical plate between, forming the cab bracket or support for the running boards and firing deck. The firing deck is on a level with the running boards, and the tender floor is also raised so as to form a flush deck throughout; a steel casting is used in the rear for attaching the draft rigging. The boiler is supported on each side by two expansion pads, one at the extreme rear and the other at the usual point just ahead of the rear driving wheels. This would seem to be carrying out the ideas presented in the report on cylinder fastenings at the last Convention of the Master Mechanics' Association.

brick pilasters were built under these and then temporary supporting frames for the concrete were erected, which were held in place by long bolts put into the sandstone. This framework was built in horizontal sections, the uprights and planking used at the bottom being afterward used again higher up on the wall.

The length of the wall was 256 ft. 6 in., the height of the sandstone 30 ft. and that of the limestone ledge 12 ft., above which was 14 ft. of sand, gravel and

It will be readily seen from the engravings, Figs. 1 and 2, that the engine shown is quite similar to the Wisconsin Central freight engines, which were described in our issue of June 3, the only important difference being the larger boiler of the Great Northern engine, the details of which are shown in Fig. 3.

The arrangement of the spring rigging, as shown by Fig. 2, consists of equalizing the middle and rear driving wheels on either side, while the front drivers are cross-connected by a heavy spring. The builders report that this system of springs has given excellent service, and produces a remarkably steady and easy riding engine. Piston valves, 12 in. in diameter, are used, being the same design as was illustrated in connection with the Wisconsin Central engines. The reports from the piston valves of this type now in service on the Great Northern seem to be very favorable. Open hearth cast steel is used for driving wheel centers, driving boxes, spring saddles, crossheads, cylinder heads, pistons, expansion pad brackets, foot plates and some smaller castings.

To facilitate the comparison of this engine with other 10-wheel locomotives built within the last year, the following table of principal dimensions has been compiled. It may be mentioned that the Northern Pacific 10-wheelers are considered the heaviest engines of this type that have ever been built, while those of the Southern are the heaviest used up to this time for passenger service:

Name of road	Great North'n.	South'rn Railway	Wisc'n'n Central	North'rn Pacific.
Published in *Railroad Gazette*		March 4, 1898.	June 3, 1898.	May 14, 1897.
Maker	Brooks	Richmond.	Brooks.	Schenectady.
Kind of service	Pass.	Pass.	Freight.	Freight.
Weight on drivers...lbs.	129,500	121,250	115,000	126,000
Weight on truck wheels ... lbs.	36,500	36,750	34,000	46,500
Weight, total.... lbs.	166,000	158,000	149,000	172,500
Wheel base, total engine ..... ft in.	25 4	26 1	24 9	25 11
Wheel base, driving, ft. in.	14 6	14 7	14 6	14 10
Heating surface, fire box.... ... .sq. ft.	223	193	189	240
Heating surface tubes.... . sq. ft	2,452	2,217	2,111	2,655
Heating surface, total .... sq. ft.	2,677	2,410	2,300	2,895
Grate area ....sq. ft.	35.4	34.9	32.4	34.2
Drivers, diam.. .....in.	63	72	63	63
Cylinders.....in. x in	20 x 30	21 x 28	20 x 26	22 and 34 x 26.
Boiler, type	Belpaire.	Ext'nd'd wagon top	Belpaire.	Ext'nd'd wagon top.
Working steam pressure....lbs per sq. in.	210	200	200	200
Barrel, outside diam. in.	70	62	66	70
Fire box, length...ft. in.	10 3	10 0	9 5	10 $0^3/_{16}$
" width...ft. in.	3 5¼	3 5⅛	3 5⅜	3 5
" depth, front, ft. in	6 8	6 3	6 6	7 0
Fire box, depth, back, ft. in.	5 2	5 0½	5 0	5 11½

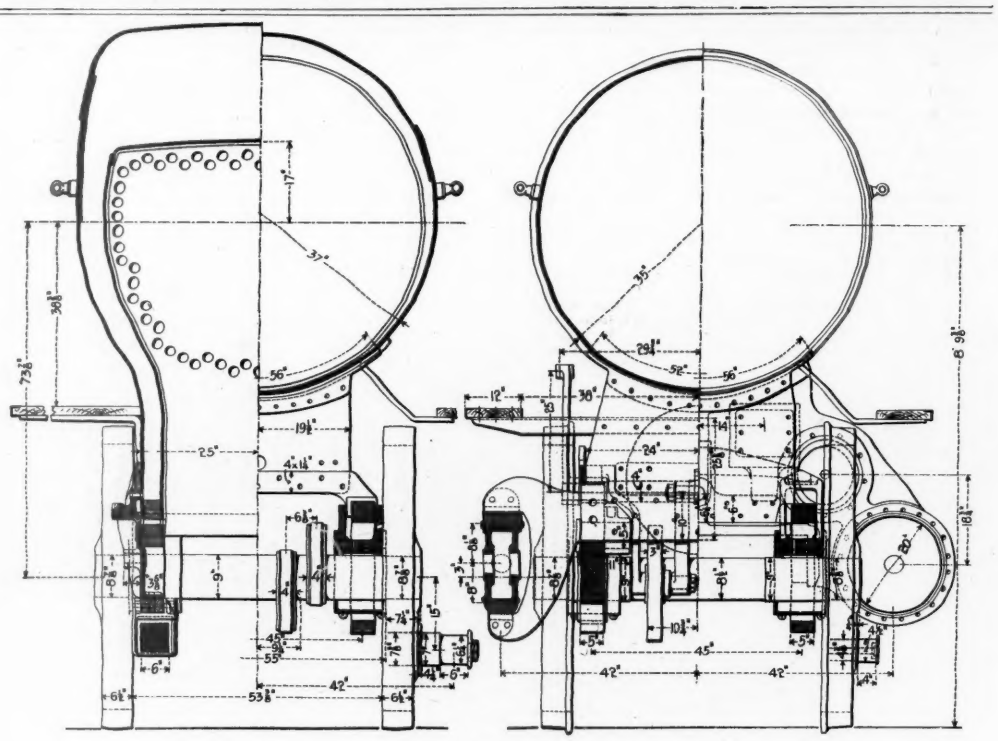


Fig. 2A.—Cross-Sections, Great Northern Locomotive.

The remaining dimensions of the Great Northern engines are given below, together with the names of the makers of the more important special equipment:

Gage ..... 4 ft. 8½ in.
Kind of fuel to be used ..... Bituminous coal
Weight tender, loaded ..... 96,000 lbs.
Wheel base, total, engine and tender ..... 53 ft. 7½ in.
Length over all, engine ..... 40 ft. 1⅝ in.
" over all, total, engine and tender ..... 62 ft. 2⅜ in.
Height, center of boiler above rails ..... 8 ft. 9⅝ in.
" of stack above rails ..... 14 ft. 11¾ in.
Drivers, material of centers ..... Cast steel
Truck wheels, diameter ..... 30 in.
Journals, driving axle, main ..... 9 in. x 11 in.
" " " front and back ..... 9 in. x 11 in.
" truck ..... 5½ in. x 12 in.
Main crank pin, size ..... 6¼ in. x 6 in.
Piston rod, diameter ..... 4 in.
Kind of piston rod packing ..... Metallic
Main rod, length, center to center ..... 120½ in.
Steam ports, length ..... 18 in.
" " width ..... 2 in.
Exhaust ports, length ..... 56 in.
" " least area ..... 66.6 sq. in.
Bridge, width ..... 2½ in.
Valves, kind of ..... Improved piston
" greatest travel ..... 7 in.
" steam lap (inside) ..... 1⅛ in.
" exhaust lap or clearance (outside) ..... ⅜ in.
Lead in full gear ..... ⅛ in. negative
Boiler, material in barrel ..... Steel
" thickness of material in barrel ..... ¼ in.
" " " tube sheet ..... ⅝ in.
Seams, kind of horizontal ..... Sextuple
" " " circumferential ..... Double and triple
Crown sheet, stayed with ..... Direct stays
Dome, diameter ..... 30 in.
Firebox, type ..... Long, sloping
" material ..... Steel
" thickness of sheets—
Crown, ⅜ in.; tube, ⅝ in.; side and back, ⅜ in.
" brick arch ..... On water tubes
" mud ring, width—
Back, 3½ in; sides, 3½ in.; front, 4 in.
" water space at top—
Back, 4½ in.; sides, 6 in.; front, 4 in.
Grates, kind of ..... Cast iron rocking
Tubes, number of 303
" material ..... Charcoal iron
" outside diameter ..... 2¼ in.
" thickness ..... No. 11 B. W. G.
" length over tube sheets ..... 13 ft. 10¼ in.
Smokebox, diameter outside ..... 72¾ in.
" length from flue sheet ..... 64 in.
Exhaust nozzle ..... Single
" " ..... Permanent
" " diameter ..... 5 in.; $5^1/_8$ in.; $5^5/_8$ in.
" " distance of tip below center of boiler, ... 1 in.
Netting ..... Wire
" size of mesh ..... 2½ x 2½ and 2¼ x 1¼
Stack, straight or taper ..... Steel taper
" least diameter ..... 15⅞ in.
" greatest diameter ..... 18⅞ in.
" height above smokebox ..... 38 in.

Tender.

Type ..... 8-wheel, steel frame
Tank, type ..... "U" shape
" capacity for water ..... 4,500 gals.
" " " coal ..... 8 tons
" material ..... Steel
" thickness of sheets ..... ⅜ in. and ¼ in.
Type of under frame ..... Steel channel
" " springs ..... ½ elliptic
Diameter of wheels ..... 33 in.
" and length of journals ..... 4¼ in. x 8 in.
Distance between centers of journals ..... 4 ft. 10 in.
Diameter of wheel fit on axle ..... 5⅜ in.
" " center of axle ..... 4¾ in.
Length of tender over bumper beams ..... 21 ft. 4 in.
" " tank ..... 19 ft. 6 in.
Width " " ..... 8 ft. 8 in.
Height " " not including collar ..... 55 in.
Type of draw gear ..... M. C. B. standard

Special Equipment.

Air brakes ..... New York Air Brake Co.
Lubricators ..... Nathan Mfg. Co.
Safety valves ..... Crosby Steam Gage & Valve Co.
Injectors ..... New Nathan No. 10 and Monitor No. 10; Nathan Mfg. Co.
Springs ..... A. French Spring Co.
Metallic packing ..... C. C. Jerome

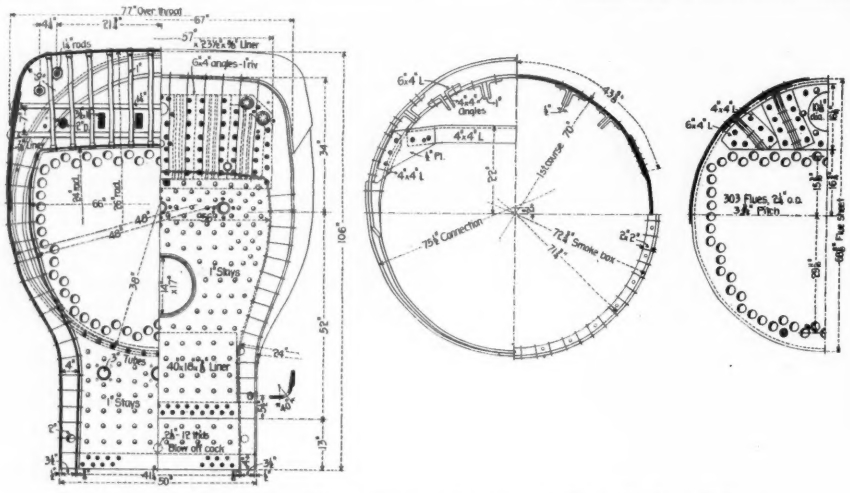


Fig. 3A.—Boiler Details, Ten-Wheel Passenger Locomotive, Great Northern Railway

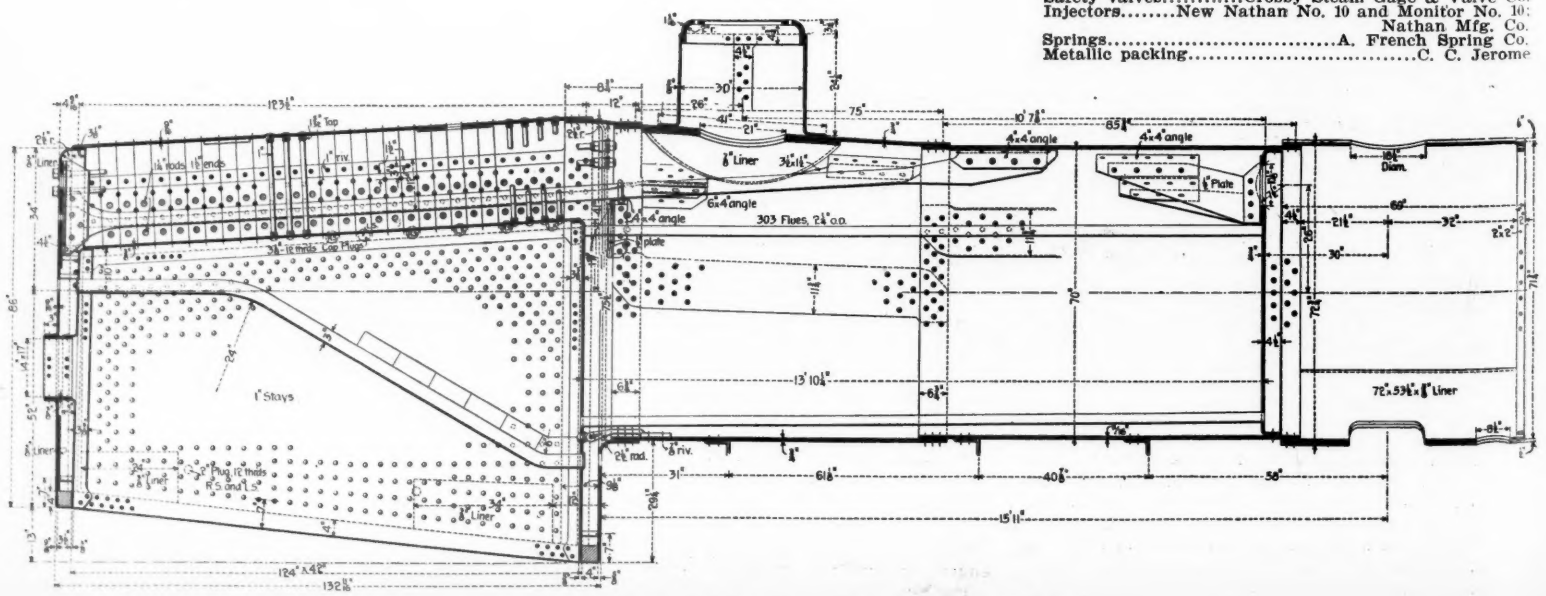
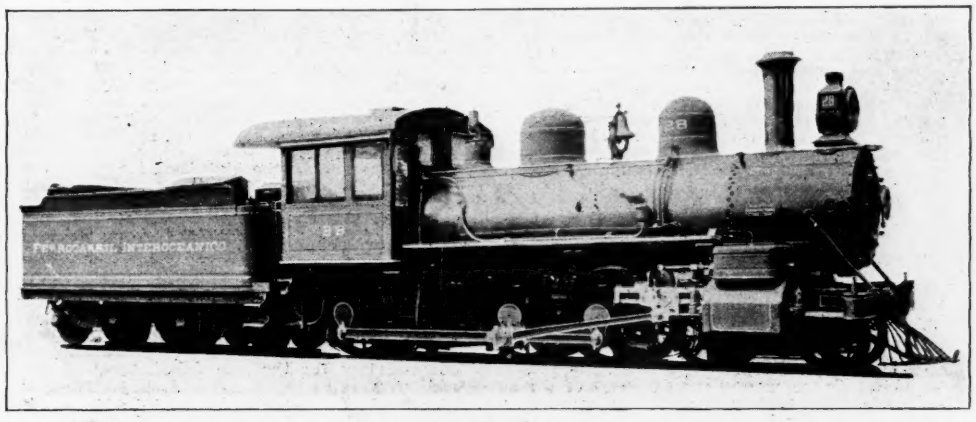


Fig. 3.—Boiler Details, Ten-Wheel Passenger Locomotive, Great Northern Railway

Locomotives for the Interoceanic Railway, Mexico.

The Schenectady Locomotive Works has recently completed two compound 10-wheel passenger and six single expansion, consolidation freight locomotives for the Interoceanic Railway of Mexico, the designs for which were worked out by the builders in consultation with Mr. Henry E. Walker, Locomotive and Car Superintendent of that road. The general appearance of the passenger engines is shown by the accompanying engraving, and in all matters of detail the passenger are the same as the freight locomotives. As this is a narrow gage road, 3 ft. wide, the frames are placed outside the driving wheels. Steel cabs, cast steel driving wheels and cast steel driving boxes, with bronze facings, are used. The boilers are of the straight barrel type, those of the passenger engines carrying a pressure of 200, and the freight engines 180 lbs. per sq. in. The fuel used is coal briquettes. The tenders are the same for both classes of engines, weight 31,000 lbs. empty, and have a capacity for 4½ tons of coal and 3,000 gals. of water; the underframes are made of 8 in. steel channels.



Schenectady Ten-Wheel Passenger Locomotive for the Interoceanic Railway of Mexico.

The following are the principal general dimensions:

	Ten-wheel Passenger.	Consolidation Freight.
Weight in working order, total....lbs.	90,500	91,000
" on driving wheels.....lbs.	58,000	82,000
Wheel base, driving.....ft.-in.	13-2	10-11
" " total .....ft.-in.	22-5	17-2
Cylinders, diam.....in.	17 and 27	16
Piston, stroke.....in.	20	20
Driving wheels, diam.....in.	48	38
Boiler, style.....	Straight	Straight
" outside diam. of first ring...in.	52	56
" working steam pressure.sq. in.	200	180
" material .....Steel	Steel	
Fire box, length.....in.	49⅜	54
" " width .....in.	44⅞	44⅞
" " depth .....in.	61	60½
" " material .....Steel	Steel	
Tubes, number.....	199	179
" diam. .....in.	1¾	2
Heating surface, tubes.....sq. ft.	1,049	1,351
" " firebox .....sq. ft.	82	82
" " total .....sq. ft.	1,131	1,433
Grate surface.....sq. ft.	15.3	16.9

The special equipment includes Westinghouse air brakes, Nathan lubricators, Sellers class "N" injectors, Leach sanding devices, Crosby safety valves, steam gages and whistles, and United States metallic packing for piston and valve rods.

The Roberts Central Exhaust Cylinder.

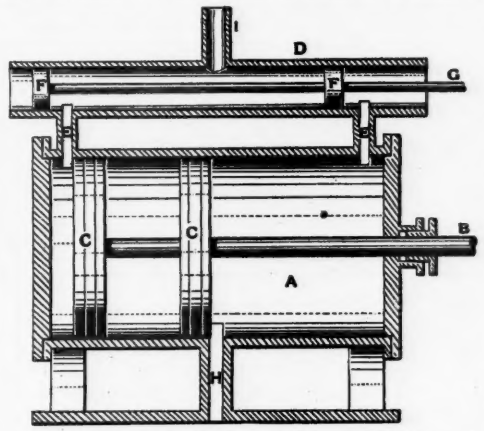
In our issue of Aug. 5 we described the "Cleveland" central exhaust cylinder as applied to a locomotive on the Intercolonial Railway of Canada. At the time we had some doubts as to its being a desirable thing to use from a mechanical point of view, and we were confirmed in this by a prominent locomotive builder. Since then, as our readers are probably aware, this arrangement has been so persistently kept before the public and such extravagant claims have been made for it, that in certain quarters it has already been classed with enterprises of the Shaw and Holman type.

Mr. J. Snowden Bell, of Pittsburgh, has called our attention to a feature of this arrangement which we had not considered, namely, its essential identity with designs long ago proposed and put in practice, and, at our request, has furnished some data from the patent records and other sources concerning central exhaust cylinders, from which one is led to conclude that the holders of the "Cleveland" patents have nothing to sell. Possibly this may be as great a surprise to the owners of the patents themselves as to the railroads with which they have tried to do business. It would appear, however, that if any road cares to use central exhaust cylinders it can do so without infringement.

The central exhaust design is at least as old as 1857, when Mr. B. Eaton patented such an arrangement for a steam slide valve, his patent being No. 17,142. In 1867 Mr. J. M. Hirlinger (patent No. 70,841), also made use of a central exhaust passage in connection with a design of steam slide valve, but what appears to embody all the essential features of the "Cleveland" cylinder is the arrangement patented by Messrs. John Shepherd and Carlos A. Clark of Bloomfield, Ia., in 1872 (patent No. 124,980). The drawing accompanying this patent is reproduced, and the claim made is as folows:

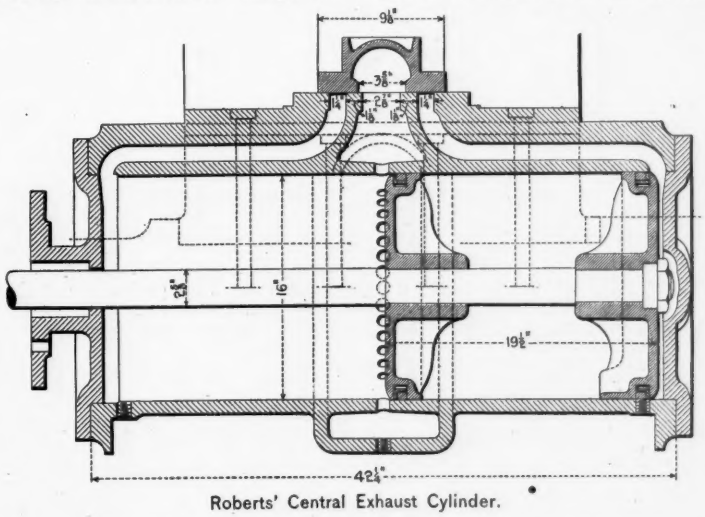
"We claim as new and desire to secure by letters patent the piston CC on the rod B, the cylinder A provided with the central exhaust-port H, the induction ports EE, opened-ended cylinder or steam-chest D provided with a pipe I, and the pistons FF on rod G, all relatively arranged and constructed as shown."

The next in order was the Roberts central exhaust cylinder, which was essentially the same as that patented by Shepherd and Clark, and doubtless for this reason it was never patented in the United States, although an English patent, No. 2,516, was taken out by Roberts in 1874. The Roberts cylinder is particularly interesting in this connection, as it was applied to a locomotive built by the Brooks Locomotive Works and is practically the same as the "Cleveland" cylinder. A description of Roberts' cylinder as



Shepherd & Clark's Central Exhaust Cylinder.

first applied, was published in the Railroad Gazette Feb. 13, 1875, with a large illustration, but the final arrangement is shown by the accompanying engraving, made from a drawing furnished by Mr. M. L. Hinman of the Brooks Works. This early description gives no information of the results of this experiment, and so far we have been unable to find in any succeeding issue mention of this device; the following extracts from a letter written by Mr. Hinman to Mr. Bell may therefore be of interest. Col. E. A. L. Roberts of Titusville, Pa., was an inventor and maker of torpedoes, which were successfully and largely used in the Pennsylvania oil region for increasing the flow of oil wells. Mr. Hinman says: "Col. Roberts came to Dunkirk in the early summer of 1874, had conferences with the late Horatio G. Brooks, the founder of our works, in regard to building a locomotive with his double exhaust cylinders, and these conferences resulted in our applying his device to a 15 in. x 22 in. cylinder locomotive which we had nearly completed; removing the same and applying the Roberts cylinders, which were 16 in. in diameter by 20 in. stroke. The boiler in this locomotive had a firebox 54 in. long and 34 in. wide inside, with 140 2-in. tubes, 11 ft. 5 in. long. There were four driving wheels on 50½-in. wheel centers, and the weight of engine in working order was 63,100 lbs. The engine truck wheels were spread to permit the use of the long cylinders.



Roberts' Central Exhaust Cylinder.

"The first pair of cylinders applied to this locomotive had a circumferential slot about ⅞ in. wide, connecting the cylinder with the central annular exhaust passage, but a brief experience demonstrated that the snap ring packing was liable to catch on the sides of this slot, or exhaust passage. We subsequently applied two new cylinders, drilling holes from the cylinder to the annular opening, which obviated the difficulty and enabled us to use the Dunbar sectional steam packing. With this arrangement it worked satisfactorily.

"This locomotive remained our property, and was tested in service on the Dunkirk, Allegheny Valley & Pittsburgh Railroad in 1875, where its performance in service was remarkable, that is, to use the phraseology of trainmen, it was 'smarter than chain lightning.' With three or four cars it would get away from a station so quickly that the most expert trainman standing at the third car from the rear would not be able to get aboard of the last coach. No record was kept in those days of the consumption of fuel or water. After several months' service on the above-named road, it was placed on the Lake Shore & Michigan Southern. In this service it was badly handicapped, as the trains were much heavier and the steam capacity of the boiler was insufficient to supply the cylinders. After a few weeks' service on the Lake Shore it was returned to our works and remained until June, 1880, when we sold the engine to the Ohio Central, where, after some service, the cylinders were removed and the ordinary type applied.

"After a few weeks' trial in 1875, we endeavored to make an arrangement with Col. Roberts to build a boiler with much larger grate area, which would be capable of generating sufficient steam to economically supply the cylinders, but were unsuccessful, although repeated endeavors were made by Mr. Brooks and the writer during the time that the engine was in service and after it was returned to our works.

"Col. Roberts built in Titusville, Pa., a large number of oil well engines with this principle applied which also rendered excellent service, and gained the reputation of being the 'smartest' engines for drilling oil wells that were used in the Pennsylvania oil field. In our judgment and recollection, the failure of its general introduction and use was not so much owing to any errors in the mechanical principle involved, as in the eccentric inventor, who died in 1882."

Concerning the performance of this engine on the Ohio Central and the reasons why the change was made to ordinary cylinders, we have learned from an officer of the road that "this engine always gave a great deal of trouble in pounding, breaking frame bolts and frame connections; also the frames back of the cylinders broke twice, and finally the holes that were drilled in the cylinders for the double exhaust broke out, so that in order to get further use of the engine it became necessary to apply other cylinders."

It will thus be seen that the fault was largely with the details, and in the opinion of the builders resulted from putting the double exhaust cylinders on an engine which was practically completed before the change was decided on, and which was not especially adapted for the use of the Roberts cylinders. It is, therefore, held that the experience of the Toledo & Ohio Central was of such a nature as not to condemn the double exhaust feature. It will, however, be obvious from the foregoing historical record that whatever advantages it may possess are public property.

Railroads and the Rotation of the Earth.

The old topic of the displacement of a railroad track in consequence of the rotation of the earth on its axis, is the subject of an article in the new edition of "Meyer's Konversations Lexikon," of which the following is a brief abstract:

Every body on the earth's surface partakes of the rotative motion of the earth around its axis at the place where the body happens to be. This motion gradually decreases in amount from the equator to the poles. If now a body moves from the equator towards the poles along a meridian, it has besides its velocity in the direction of its motion, another motion corresponding to the rotative velocity at the

parallel of latitude where it happens to be. If the body moves from the equator toward the poles, this motion constantly decreases, while the body, by virtue of its momentum, tends to preserve the same velocity. There is, therefore, a sidewise pressure in the direction of the earth's rotation, that is from west to east. If the body moves from the poles towards the equator, there is a lag in the motion and the pressure is from the east toward the west.

The question has been many times asked, whether this side pressure of a railroad train, for instance, upon a track running north and south, tends to spread the rails or to move them on the ties and whether the easterly or westerly rail of such a track tends to become worn more than the other. According to observations of F. Koller, in Munich, who has investigated this question, a locomotive weighing 40,000 kg. running at a speed of 20 metres per second, exerts in consequence of the rotation of the earth a side pressure on one rail in excess of that on the other of 68 kg. (150 lbs.). The friction of the engine on the rails causes a resistance to any side movement of about 6,000 kg. (13,000 lbs.), and the resistance to the movement of the rails on the ties is still more. The side pressure is, therefore, insignificant as compared with the resistance due to friction, and very much smaller than that caused by the centrifugal force on curves or the wind pressure when the direction of the wind is transverse to that of the train. This latter sometimes amounts to 3,000 kg. or more. There appears to be, therefore, no appreciable danger of accident from this cause, and where the rails have moved it must be charged to other causes than the side pressure due to the rotation of the earth.

Cost of Electric Power for Street Railroads.—II.*

By R. W. Conant.

(Continued from page 705.)

I have compiled and classified the data on representative steam stations throughout the country; tables No. 1 and No. 2 give the results.

The general arrangement of the tables is as follows: Each vertical column contains the data for a different station during a stated period. Each station is represented by a number, which appears at the head of the column. The first column is headed S, for standard station; following down the column, first comes the capacity expressed in multiples of 1,000 k.w., 3.6 meaning 3,600 k.w. The number of units of engines 3, ditto for generators 3, number of units engine per 1,000 k.w. capacity is .83, obtained by dividing 3 by 3.6; ditto for generators .83. The next line under type is a description as to whether the engines are belted or direct connected to the generators. B for the former and D C for the latter. The two lines marked S, C, T and N or C refer to engines, simple compound or triple non-condensing or condensing, as in standard, C C is compound condensing.

The period during which the averages are taken is given in days. Load factor is in per cent. Inserted in the proper place under costs are the per cent., S, and per cent. total, which figures represent the per cents. the items bear to the corresponding ones for standard, and to the total operating expense respectively.

The number of shifts, duration in hours and shift hours, together with the rate of pay of men, in cents per hour, and number of men per shift per 1,000 k.w. capacity complete the data necessary for the analysis of the cost of labor. Costs are all expressed in cents per k.w. hour. Opposite fuel, pounds of coal per k.w. hour and price, which is dollars per short ton, give the necessary figures to analyze the cost of fuel per k.w. hour. Kind A or B refer to anthracite or bituminous, respectively.

Repairs, supplies other than coal, that is, water, oil, waste, lamps and miscellaneous, as well as superintendence and general expenses, are treated as one item, hereafter called general expense.

As a supplement to the tables, in order to more clearly illustrate the relation of the costs, I have constructed Diagrams 1 and 2, in which these are represented by different characters of lines as to shading.

The diagram for table No. 1 is laid out in six groups, one group for each station. The first or left hand column in each group represents the costs for the standard station. You will notice that its total length, including the black, is about equal to the distance between 0 and 1, so that, including fixed charges, the cost of power per k.w. hour per annum for the standard station amounts to about 1 cent. It also appears that the fixed charges are approximately equal to the coal. Labor is roughly about half the coal, and general expense about half the labor. These proportions are simply and easily remembered, and we might expect them to hold approximately for stations under similar governing conditions.

I shall next call to your attention Station No. 3, whose equipment differs from the standard as follows: It has two units instead of three. Each generator is 800 k.w., making a capacity of about half that of the standard. The generators and engines are direct connected, the latter being compound condensing, smaller, of course, than the standard, but in other respects similar. Three 500 h.p. water tube boilers, economizers and heaters complete the important part of its equipment.

An examination of Group 3 in Diagram 1 shows that the men per 1,000 k.w. is nearly double what is required for standard. This would double the labor expense, providing the rate of pay and load factor remained the same, but by a coincidence the rate of pay is lower and the load factor enough higher to bring the labor expense to nearly standard figures.

To illustrate the effect of a high load factor in reducing the cost of labor per k.w. hour it will be interesting to look at the next shaded column for this station, which represents the cost during January. In this month the load factor was 59, as against 46 for the year, and it will be noticed that the labor is reduced to less than the standard. The reduction in the total cost for this month, as against the yearly, is also apparent, and this is due principally to the reduction in labor.

It will be seen that the coal expense is but slightly less, and seems not to be much reduced by the increased load factor. The explanation of this lies in the fact that the station is tied in with others, which keeps its load from fluctuating even on the low load factor. This will be still further exemplified by referring to a light month; the column at the right of the group gives the costs for September, during which the load factor was 43, as against 59 for January. The coal expense is still further diminished, and, by reference to the table, will be found to be due to an increase in the efficiency of the station. This might be found to be on account of not having to force the boilers. The increase of labor due to the low load factor is to be noticed.

I wish to say at this point that it is impossible for me in the limited time to give you more than a general idea of the large number of interesting facts which may be obtained by careful study of the tables.

Plant No. 2 is somewhat larger than the last, and is equipped with two 1,000 k.w. generators, direct connected to compound condensing engines. It has also economizers and heaters. Its costs are in column No. 2. In looking at the yearly average it will be noticed that the total costs rise above the standard, and is due to an increase in labor and general expense. Coal, as before, is the same, the decreased efficiency being balanced by the lower price per ton. Examining the table with a view to accounting for the increase of labor we find the load factor approximately the same as standard, but an increase in the number of men per 1,000 k.w. This is accounted for by the smaller size of the station. General expense is greater, as would be expected. A glance at the shaded diagram representing the heavy month for this station gives a nice illustration of the effect of the high load factor, which is 51, as against 33 for the year. It is to be noticed that the coal

Group No. 4 (Diagram 1; also 5th column in Table I under "4") indicates the costs for this station. The yearly average shows that we are approaching standard figures in labor. This item is not much less, as the units are only slightly greater capacity. Load factor, rate of pay and men per 1,000 k.w., correspond very closely with standard. The general expense and coal bring the total somewhat higher. General expense is high on account of the heavy repair account. The station is about eight years old, and repairs are heavy, due to replacing of worn out parts. The decrease in efficiency, as shown by pounds of coal per k.w. hour, might be shown by a test to be due to old boilers.

The plants just considered have all been direct connected. Station No. 5 is a belted plant a little more than one-half the capacity of the standard, equipped with seven 340 k.w. generators belted to a countershaft, to which are belted three triple condensing engines, the auxiliary apparatus affecting the economy of the station, being economizers and feed water heaters.

Notwithstanding the high load factor, 52 per cent. of the labor for the year is still above standard. This would be expected from the multiplicity of parts to look after in a belted countershaft station. The reduction of general expense and labor in the heavy month is due to the load factor of 64 per cent.

Group No. 4, Diagram 1, gives the costs for a belted plant of about one-fifth the capacity of standard. Its equipment is twelve generators belted to four simple high speed non-condensing engines. There are feed water heaters, but no economizer. High coal consumption is the feature of this diagram, the cost of fuel alone for the year being equal to the total operating expenses for standard. Labor is also high, and the total cost of power per k.w. hour is nearly double the operating expense of standard. This station furnishes a good illustration of the effect on the cost of power of a simple non-condensing belted equipment. It is to be remarked also that this plant has the benefit of a high load factor.

It will now be interesting to turn our attention to a small direct connected station, which is numbered 1. This operates about 30 cars. It is equipped with three 200 k.w. generators, has compound condensing engines, heaters, but no economizers. It does not feed in with other stations, as do those which have been previously mentioned, and has a very fluctuating load, as may be imagined in the operation of so small a number of cars. This station is just one-sixth the size of the standard, and it will be noticed that the column representing its operating expenses is about twice as high. The great increase is in the labor, although the station is operated by a corporation which has had a vast amount of experience in railroad work. Can we account for this increase in labor? By referring to the table we find the rate of pay of men is practically the same as standard, the load factor is low, 22 per cent., as against 33.

Referring to the heavy month for this station, which is practically the same, the reduction coming in the other two items. This brings the total cost for the month below standard. In the light month, with a low load factor of 28 per cent., the labor increase is very apparent.

I shall now present the costs of operation of a large station. Its equipment consists of six 1,200 k.w. generators direct connected to triple condensing engines, two 1,500 k.w. generators direct connected to compound condensing engines, and an auxiliary plant of forty 62 k.w. generators belted to compound non-condensing engines, and only used in case of emergency. Economizers, heaters and electric feed pumps complete the important part of the equipment.

has the benefit of a 30 per cent. load factor, we find that the labor is reduced, but it is still a long way from bedrock figures. The examination of the table discloses the fact that the increase comes in the men per 1,000 k.w., being about 2.5 times the standard figure. The station records show the following men operating: On the first shift, two engineers and one fireman; second shift, one engineer, one oiler and one fireman; third shift, one engineer and one fireman. Can this number of men be reduced? In a station whose equipment requires that the boilers be hand fired it is, to say the least, difficult to imagine that the boilers could be operated with less than one fireman per shift. The secret then for

TABLE No. 1.—SHOWING COST OF OPERATION OF POWER STATIONS.

No. of Station.	S	1	2	3	4	5	6	S	1	2	3	4	5	6	S.	1	2	3	4	5	6
Cap. in 1,000 k. w	3 6	.6	2	1.6	12.68	2.38	.744	3.6	.6	2	1.6	12 68	2.38	.744	3.6	.6	2	1.6	12.68	2.38	.744
TYPE—																					
Units E	3	3	2	2	8	2	4	3	3	2	2	8	2	4	.3	3	2	2	8	2	4
Units G	3	3	2	2	8	7	12	3	3	2	2	8	7	12	.3	3	2	2	8	7	12
Units E per 1,000 k. w	.83	5	1	1.25	.63	.84	5.4	.83	5	1	1.25	.63	.84	5.4	.83	5	1	1.25	.63	.84	5.4
Units G per 1,000 k. w	.83	5	1	1.25	.63	2.94	16.2	.83	5	1	1.25	.63	2.94	16.2	.83	5	1	1.25	.63	2.94	16.2
B. D. C.	D. C.	D. C.	D. C.	D. C	D. C.	B.	B.	D. C.	D. C.	D. C.	D. C.	D. C.	B	B.	D. C.	D. C.	D. C.	D. C.	D. C.	B.	B.
S. C. T.	C.	C.	C.	C.	C. T.	T.	S.	C.	C.	C.	C.	C. T.	T.	S.	C.	C.	C.	C.	C. T.	T.	S.
N. or C.	C.	C.	C.	C.	C. C.	C.	N.	C.	C.	C.	C.	C. C.	C.	N.	C.	C.	C.	C.	C. C.	C.	N.
PERIOD—Days	365	365	343	365	365	365	365	31	31	31	31	31	31	31	30	30	30	30	30	30	30
	1897.							January, 1897.							September, 1887.						
LOAD FACTOR—																					
Per cent	33⅓	22.3	33.6	46.4	34.8	52.2	47	33⅓	30	50.6	58.6	46.4	61	48.4	33⅓	17.7	28	43.2	27.6	42.6	43
Per cent. of S		67	101	139.5	104	157	141		90	152	176	140	192	145.5		53.2	84	130	83	128	129
LABOR—Cost in cts.																					
Shifts	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Duration	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Shift-hours	8.760	8,760	8,232	8,760	8,760	8,760	8,760	744	744	744	744	744	744	744	720	720	720	720	720	720	720
Men per 1,000 k. w	1.94	4.67	2.91	3.36	1.9	4.79	5 95	1.94	4.66	2.95	3.24	1.93	4.93	6.36	1.94	4.96	3	3.8	1.77	4.5	6
Rate-pay	27	24.8	25.7	25.8	28.6	26.6	25.3	27	26.5	26.2	25	23	25.8	25.6	27	25	25.6	24.4	28.4	27.6	24.2
Per k. w. hour	.157	.56	.233	.187	.156	.243	.321	.157	.41	.153	.138	.121	.198	.336	.157	.7 5	.273	.215	.182	.292	.338
Per cent. total op.	27	46.7	32.5	29.4	22.6	28.7	29.1	27	47	27.2	23	18.3	26.8	27.7	27	51.4	40.6	32.5	25.9	31.8	31.7
Per cent. S		156	142	119	99.1	154	204		261	97.4	88	77	127	214		448	174	137	116	186	215
FUEL—Cost in cts.																					
Lbs. per k. w. hour	2.2	3.18	2.48	2.61	2.86	3 24	4.13	2.2	3.07	2.36	2.65	2.74	3 19	4 74	2.2	3.3	2.34	2 48	2.84	3.3	4.05
Price per short ton $	3	2.6	2.62	2.6	2.72	2.6	2.9	3	2.75	2 65	2 54	2.88	2.71	3.08	3	2.48	2.56	2.53	2.43	2.56	2.44
Kind, A or B	B.	.3 A. .7 B.	.25 A. .75 B.	.3 A. .7 B.	B.	.2 A. .8 B.	B.	B.	.3 A. .7 B.	.25 A. .75 B.	.3 A. .7 B.	B.	.2 A. .8 B.	B.	B.	.3 A. .7 B.	.25 A. .75 B.	.3 A. .7 B	B.	.2 A. .8 B.	B.
Per k. w. hour	.33	.414	.325	.340	.389	.42	.599	.33	.421	.313	.337	.395	.430	.723	.33	.409	.299	.314	.345	.423	.494
Per cent. total op.	57	34.5	47.4	51.6	55.2	49.7	54.3	57	42	55.6	56.4	59 9	58.4	60.1	57	29.8	44.3	47.5	48.8	46.1	46.4
Per cent. S		125.5	98.5	103	117.5	127	182		127.5	94 5	1 2	120	130	220		124	91	95	104	128	140.5
REPAIRS, SUPPLIES & SUPT. & GEN. EXPENSES.																					
Per k. w. hour	.093	.225	.138	.132	.159	.182	.182	.093	.172	.0975	.123	.144	.109	.14	.093	.258	.102	.133	.176	.203	.233
Per cent. total op.	16.	18.8	20.1	20.	22.6	21.6	16.5	16.	17.	17.2	20.6	21.81	14 8	12 2	16.	18.8	15.1	20	25.1	22.1	21.9
Per cent. S		242	148	142	171	196	196		185	105	132	155	117	158		278	110	143	189	218	250
TOTAL OPER.—Cents.																					
Per k. w. hour	.58	1.198	.686	.659	.704	.845	1.102	.58	1.003	.563	.598	.66	.737	1.2 2	.53	1.372	.671	.662	.703	918	1.065
Per cent. S		205	118	114	122	146	190		172.5	97.	103	114	127	208		236	116	114.5	121	157	184
FIXED CHARGES.																					
Per k. w. hour	.405							.405							.405						
Per cent. total op.	70							70							70						
Per cent. S																					
Grand Total	.985																				

the large number of men per 1,000 k.w. lies in the small number of k.w. capacity. These same men could look after a station of greater capacity.

I shall next give the costs on plant No. 12, whose figures are presented in table No. 2. This plant is about one-third the size of standard. It does not feed in with other stations. Its generators are belted to three tandem compound condensing engines, which operate under steam pressure of 110 lbs. It has water tube boilers averaging four years of service, heaters, but no economizers. A good quality of bituminous coal is used, which costs $2.93 per ton. By reference to the table it will be seen that this station produced power to the extent of 23 per cent. of its capacity during the past year at $.00149 per k.w. hour, including fixed charges, the operating expenses alone amounting to a little over 1 cent. The total cost of operation for the year was $23,000, of which $13,610 was for coal. Water costs this station nothing, and the labor was about one-half the coal bill. By referring to the diagram No. 12 it will be seen that the coal and labor are both much higher than the standard, and if standard performance had been reached a saving of $10,000 would have been made in the operating expenses for the year. An analysis of the multiplicity of units will do for labor, the figure being 6.3 men per 1,000 k.w. The effect of this would be much more apparent on the diagram were it not for the high load factor and low rate of pay.

Plant No. 16 is of 1,600 k.w. capacity. The cost for power for past year was $53,000. Load factor is the same as standard. Standard operates to produce about double the output for the same figure.

Station No. 28 is 1,400 k.w. capacity, has slow speed condensing engines, heaters and economizers. The feed water leaves economizer at the high temperature of 258°. The engines are simple belted to the generators, and coal costs $1.63 per ton.

Plant No. 29 is a compound, condensing slow speed belted station of 1,900 k.w. capacity, and feeds in with another station. The coal costs $3.86. Plants Nos. 30 and 31 are operated by the same corporation as No. 29.

No. 32 is a combination of two power houses feeding into the same system. These stations are interesting, is of slightly greater capacity than No. 35, but has three engines and eleven generators, which require eight men per 1,000 k.w. capacity. It has a load factor of but 11 per cent. during 151 days, from Jan. 1 to May 31, 1898. The effect of this on the cost of labor is very apparent.

No. 40 has a capacity of 9,200 k.w. It is direct connected, has economizers and compound condensing engines. Anthracite coal is burned, costing $1.60 per ton. This plant operates at less than standard figures.

No. 42 is a belted plant, compound non-condensing engines, heaters, but no economizers. It has a good load factor, but the effect of the belted and small units shows in all three items.

No. 43 is a combination of alternating and direct current apparatus. It has a low load factor of 15 per cent., the effect of which is noticed on the labor.

No. 44 is a 6,000 k.w. station, and although belted, has large compound condensing engines and econ-

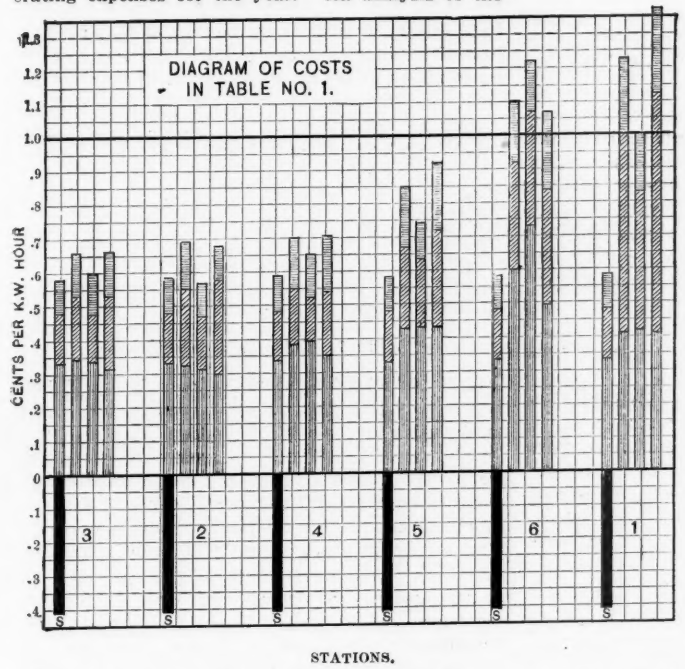


Diagram 1.—Costs of Labor, Fuel and General Expenses per K.W. Hour of Total Output in Six Power Stations.

[Horizontal shaded lines of Diagrams 1 and 2 represent cost of coal; vertical shading, cost of labor; diagonal, general expenses. The operating expenses are laid out above the base line and the fixed charges are shown in heavy black below this line. In each group of the above diagram the first vertical shaded line to the left gives the working expenses of the standard station, the average k. w. output for the year is given in the second, the heaviest load in the third and the lightest in the fourth.]

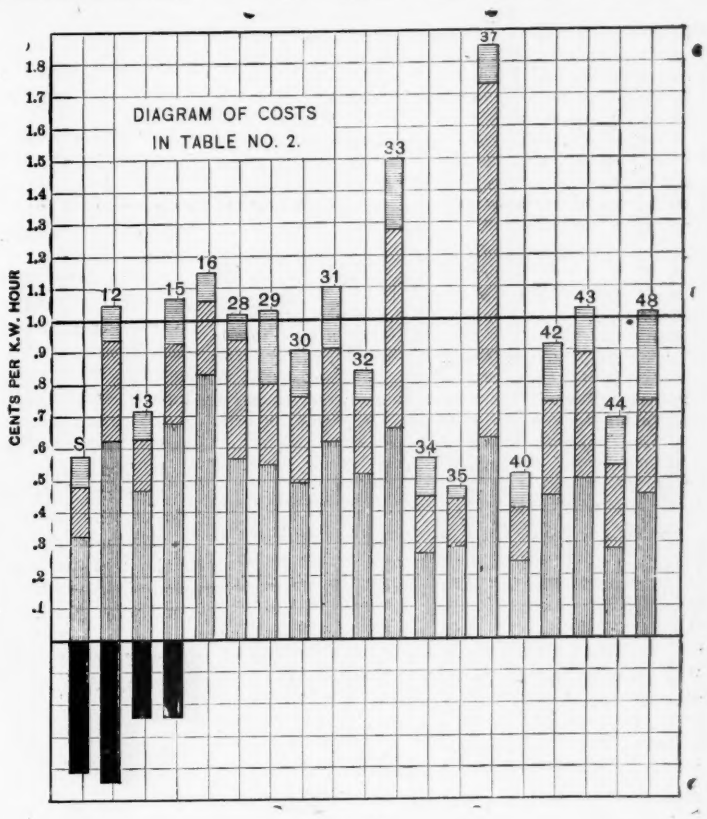


Diagram 2.—Labor and Fuel Costs, General Expenses and Fixed Charges per K. W. Hour of Average Yearly Output.

items is given in column No. 12 of the table, and by comparing with standard the differences may be readily seen.

Station No. 13 is an interesting combination of cheap coal, simple non-condensing engines direct connected to the generators, together with a high load factor. Its capacity is 70 per cent. of the standard, major part being three 800 k.w. generators; the smaller unit is 200 k.w. It produced power to the extent of 42 per cent. of its capacity at $.0096 per k.w. hour, inclusive of depreciation and fixed charges. The depreciation is charged in at 5 per cent. on a capital expenditure of about $60 per k.w. The total expense because these costs are for the past year, and since then these two stations, as well as smaller ones operated by the same company, have been consolidated into a large water-power plant, from which power is transmitted at 13,000 volts. The two steam stations shown in column 32 have five triple expansion condensing engines. This road operated on about 1.4 k.w. hours per car-mile. The coal costs $3.00 per ton. The water-power plant which replaced the steam has not been in operation long enough to enable its costs to be given.

Station No. 33 has rather a tall column, due principally to its low load factor of 16 per cent. omizers, which, with coal at $1.60, brings the cost of fuel below standard figures.

It will now be instructive to take a general survey of the shaded diagram for all stations in table No. 2. No. 37 towers above all the rest. Standard is at the extreme left. Coal in No. 37 is greater than the total operating expense for standard. This station pays but $1.75 per ton, but it uses 7.3 lbs. per k.w. hour. Compare this with No. 35, about the same size plant, paying $1.24 for coal, and using but 4.7 lbs. per k.w. hour.

I can hardly ask you to compare the labor, but it is easily seven times as large in No. 37 as in No. 35. The

TABLE No. 2.—DATA ON "OPERATION OF POWER STATIONS."

No. of Station.	S	10	11	12	13	14	15	16	17	18	19	23	25	26	28	29	30	31	32	33	34	35	37	40	42	43	44	45	47	48
Cap. in 1,000 k.w.	3.6	.4	1.4	1.0	2.6	1.6	1.6	1.6	.8	.4	3.0	.6	4.0	.2	1.4	1.9	1.7	.9	5.3	1.5	2 0	1.2	1.5	9.2	1.8	3.3	6.0	1.0	.75	.6
TYPE—																														
Units E	3	2	5	3	4	4	10	8	2	2	6	3	10	7	4	5	5	3	5	4	4	1	3	6	3	5	6	4	4	2
Units G	3	2	8	7	4	4	16	8	4	3	6	3	19	12	8	5	5	3	30	12	4	1	11	6	6	10	12	7	4	2
B. or D. C	D.C.	D.C.	B.	B.	D.C.	B. D.C.	B.	B.	B.	B.	D.C.	B.	B.	B.	B.	B	B.	B	B	B D.C.	D.C.	D.C	B.	D.C.	B.	B D.C.	B.	B. D.C.	D.C.	D.C.
S. C. T	C.	S.	S.	C.	S	S.C.	S.C.	C.	C.	S.	....	C.	S.	S.	S.	C.	C.	C.	C.	C.	C.	C.	C.S.	C.	C.	C.	C.	C.	C.	C.
N. or C	C.	N.	N.	C.	N.	N.C.	N.C.	C.	C.	N.	....	C.	N.	N.	C.	C.	C.	C.	C.	C.	C.	C.	C N.	C.	N.	C.	C.	C.	C.	C.
Period—Days	365	1	365	365	365	365	183	365	365	365	31	183	365	365	31	365	365	365	365	335	183	365	151	365	365	365	565	30	183	365
Load Factor—Per Cent	39⅓	24	23	23	42	19	41	33	24	...	..	16	33	19	23	27	23	32	31	16	57	37	11	36	45	15	30	28	20	35
Taken from Car-miles	..	...	×	...	....	....	....	....	×	....	....	×	....	....	....	....	....	....	....	....	....	....	....	....	...	....	....	...	×	×	....
LABOR—																														
Shifts	3	....	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	3	2	2	2
Duration	8	....	12	12	12	12	12	8	12	12	12	12	12	12	12	10	10	10	12	12	12	12	12	8	8	12	8	10	12	10
Shift-hours	8,760		8,760	8,760	8,760	8,760	4,380	8,760	8,760	8,760	744	4,380	8,760	8,760	744	7 300	7,300	7,300	8,760	8,760	4,392	8 760	3,624	8,760	8,760	8,760	8,760	600	4,380	7,300
Men per 1,000 k w	1.94	7.5	3.7	3.7	3.0	1.87	6.3	3.7	3.7	3.7	3.0	3.3	...	....	5.0	3.2	3.0	4 5	3 5	5 0	5.0	2.1	8.0	2.7	5.0	3.7	3.3	3.0	8.0	6.7
Rate of Pay	27	18	20	20	22	15	16	20	18	12	17	25	....	....	17	21	21	21	20	20	20	26	16	23	26	16	24	15	12	15
Cts. per k w. hr	.157	...	.22	.31	.16	....	.25	.23	.28	....	....	.51	....	....	.37	.25	.27	.29	.23	.62	.18	.15	1.1	.17	.29	.39	.26	.16	.41	.29
FUEL—																														
Lbs. per k. w. hr.	2.2	....	6.7	4.3	6.5	....	6.5	5	5	....	..	6	5.6	6.8	7	3.9	3.3	4.4	3.5	4 3	5.3	4.7	7.3	3	5.7	3.7	3.5	4.7	5.1	3.3
Price ($) per Ton	3	2	2.24	2.93	1.44	....	2.10	3.30	1.43	.75	.60	3.44	1.05	1.15	1.63	2.80	3	2.84	3	3.08	1.0	1.21	1.75	1.60	1.60	2 70	1.60	1.90	2.12	2.75
Kind—A. or B	B.	.5A. 5 B.	A.	B.	B.	....	B.	B.	B.	B.	....	B.	....	.	....	.	B.	B.	B.	B.	B	B.	.5A .5 B	A.	A.	.6 B. .4A.	A.	B.	.5A. .5 B.	B.
Cts. per k. w. hr.	.33	....	75	.63	.47	...	.68	.83	.36	....	....	1.03	.29	.39	.57	.55	.49	.62	.52	.66	.27	.29	.63	.24	.45	.50	.28	.45	54	.45
Gen. Ex.—Per k. w. hr	.093	...	.33	.11	.09	...	.14	.09	.06	....	...	.16	....	....	.08	.23	.15	.19	.09	.22	.12	.04	.12	.11	.18	.14	.15	.05	.21	.28
Total Op.—Per k. w. hr	.58	1.5	1.4	1.05	.72	....	1.07	1.15	.70	....	.63	1.7	.56	1.2	1.02	1.03	.91	1.1	.84	1.5	.57	.48	1.85	52	.92	1.03	.60	.66	1.16	1.02
Fixed Charges	.405	....	..	.44	.24	....	.24	....	....	....	....	1.	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

for the year was $92,617.28. The diagram shows labor for this station to be equal to standard, principally on account of high load factor, the other differences are also apparent. It is interesting to note that the road operated by this power station used on an average about 1.3 k.w. hours per car mile. The total car miles for the year were 7,207,308, about 10 per cent. of this mileage being trail cars.

Plant No. 15 is an interesting example of what a

Station No. 34 operated at a lower cost than standard on account of the high load factor, 57 per cent., reducing the cost of labor and low price of coal, $1 per ton.

No. 35 is a plant of 1,200 k.w. capacity, interesting on account of the fact that it has but one unit. It operates with 2.1 men per 1,000 k.w., a load factor of 3 per cent., coal costing $1.24 per ton. Its costs are quite a little lower than standard.

No. 37 is a record breaker in the opposite sense. It load factor of 11 per cent., as against 37 per cent., would make this item three times as great, and men per 1,000 k.w., 8 per cent., as against 2.1, would again increase the cost of labor three times. The higher rate of pay in plant No. 35 prevents the discrepancy being greater.

Let us look along the line for high coal cost. No. 16 seems to bear off the plam in this respect; $3.30 per ton and 5 lbs. per k.w. hour accounts for this. For strikingly low costs we have Nos. 34, 35 and 40.

RAILROAD GAZETTE

ESTABLISHED IN APRIL, 1856.
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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

At the meeting of the American Railway Association in New York City next Wednesday the committee on car service will make a report on per diem rates for interchanged freight cars, and it is understood that influential members are prepared to again put their shoulders to the wheel and try to start the long desired reform which shall lead to the final abolition of the illogical and unjust mileage plan which now prevails. It is not likely that any decisive action on the general adoption of per diem rates can be had at this meeting, but anything in the way of progress will be a ground for encouragement. In this connection it is worthy of note that the Illinois Central and the other Western roads which on July 1 adopted a variable per diem rate, are as well satisfied with their second month as with their first. For July they found, as reported in the Railroad Gazette of Aug. 26, p. 607, that an increase of 52.1 per cent., or 9.8 miles per car per day, had been effected in car movement; and, what may be also quite important, they corrected serious minor abuses at junctions. The average number of miles per car per day in July, 1898 (under the per diem basis), was 28.6; in 1897 (under the mileage basis), 18.6. The Southern Pacific has joined the Association, so that now there are seven roads; the Atchison, Topeka & Santa Fe and controlled lines; the Burlington, Cedar Rapids & Northern; the Chicago, Milwaukee & St. Paul; the Columbus, Hocking Valley & Toledo; the Missouri, Kansas & Texas; the Illinois Central and controlled lines, and the Southern Pacific (Atlantic and Pacific systems). The aggregate length of these roads is 26,649 miles, and they have 136,500 cars.

Every reader is familiar with the fact that one of the interesting questions now in the minds of railroad managers and motive power men is that of a form of motor and car to use on lines of comparatively light traffic and for comparatively short runs; that is, in places where the demand for more frequent service will probably be met by competing electric lines if the railroad companies cannot themselves meet it. We have often pointed out, furthermore, that it is not unlikely that there are many places in the country where some kind of self-contained motor can be run on tram roads where the traffic is not heavy enough to justify putting in an electric plant. The reader is familiar with the experiments that have been made on the New England, the Erie, the Cincinnati, Hamilton & Dayton and other roads with recent forms of steam motor cars, and we learn that the General Manager of the Pennsylvania Lines West of Pittsburgh is having a steam motor car built by the Baldwins for trial on one of his short runs. This whole matter is suggested again by the interesting fact that an electric road has recently bought a light locomotive to be used during the dull season when the power station will be shut down. It is thought also that this locomotive will be useful in helping out when there are excursions or other incidents demanding power beyond the capacity of the power house. Of course, there are a number of electric roads in the country which have a heavy passenger business in the summer and very little in the winter, but even when that little business is running the power house expenses cannot be much reduced. It does not seem unlikely that many electric roads, whose franchises permit running steam locomotives, can find real economy in such an arrangement.

Three Lessons from England.

The last British Board of Trade accident report, that for the three months to April 1, contains three investigations of accidents due to "failures of block working," which will be of interest to superintendents and signal engineers. Two of these cases were investigated by Colonel Yorke and the other by Colonel Addison. The last mentioned brings out a discussion of the Sykes "lock and block," and the others afford striking illustrations of the difference between American and English practice in an important detail of block signaling, and of the probable results of the two methods. These collisions will convince Englishmen—or at least the English Government inspectors—more firmly than ever that their rule requiring every train to be protected by two signals is the only safe rule; and it will strengthen their view—if they have views on the subject—that American block signaling practice lacks a necessary safeguard. These reports also afford side lights on a number of other details of train-running in England which will enable us to get a better view of some things in our own practice.

At Dunbar, on the North British Railway, Jan. 3, a freight train, switching on the main track, was run into by an express train, moving at high speed, and 20 passengers were injured; one was killed outright and four of the injuries were very serious. The second and third coaches from the engine were wrecked, and the engine itself was overturned and was pushed along on the ballast for some distance while lying on its side. The accompanying diagram, Fig. 1, will explain the situation. The freight train came in on track aA and backed some cars through the crossover track from A to B. Some of the cars jumped the track at the frogs, and the trainmen were trying to get these back on the rails when the express approached. The collision occurred before 7 a. m., when it was quite dark. The distant signal, which, if obeyed, would have prevented the collision, is 2,043 ft. back from the home signal, C, and it can be seen by the engineman 3,660 ft. before he reaches it. The home signal is also clearly visible, so that the engineman was warned no less than 5,703 ft. away. The train was running about 60 miles an hour when it passed the distant signal. It was drawn by two engines. The runner of the foremost says that he applied the brake and was trying to stop, but that his failure was due to greasy rails. But he was unaware that there was anything in the way until he struck the freight cars, and Colonel Yorke believes that the speed of the train had been reduced little, if any. The distance traversed by the train after cutting through the freight cars is conclusive evidence of this.

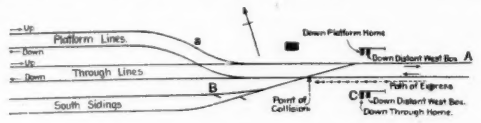


Fig. 1.—Collision at Dunbar.

The engineman knew that, according to the rules, the block signalman should not have permitted him to leave the last preceding station unless the track was clear for at least 1,320 ft. beyond the home signal at Dunbar; moreover, he could see that the home signal of the block next beyond (Dunbar west cabin) was clear for him, so that he probably assumed that there could not be any obstruction at Dunbar station, and was evidently expecting every moment to see the home signal lowered. On this assumption he delayed until he was close to the signal before applying his brake.

The signalman's offense is regarded by Colonel Yorke as greater than the engineman's. The rule required him to give "line clear" to the cabin in the rear only when the track was clear for 1,320 ft. beyond his home signal. His excuse was that he thought there was plenty of time to get the freight out of the way.

The inspector notes a number of minor points in connection with this collision. The distant signal lamps are allowed to burn 40 hours without attention; the inspector recommends that lamps be cleaned and trimmed on Sundays as well as on every other day of the week. The distant signal is only 2,043 ft. from the home signal. As the grade falls at the rate of 26.4 ft. per mile, Colonel Yorke says the distant signal should be moved out 600 to 900 ft. further. The angle of the diamond crossing, where the wreck occurred, is 1 in 9; "it is desirable that it be altered to 1 in 8; but it would be still better if the company should abolish the crossing altogether." In reporting on a collision in November at Falkirk, on the same road, Colonel Yorke expressed "an uncomfortable suspicion that the rules for absolute block working are not strictly followed by some signalmen during the night," and now he is confirmed in this view.

The freight train which was switching at Dunbar was 50 minutes ahead of its schedule time.

At Barassie Junction, on the Glasgow & South Western, Nov. 4, a passenger train was run into by a freight on a crossing, similar to that at Dunbar. The circumstances will be understood by an examination of the drawing, Fig. 2. The passenger train and the freight were offered to Signalman Norrie at Barassie about the same time, and "accepted" by him. If he had kept facing point switch

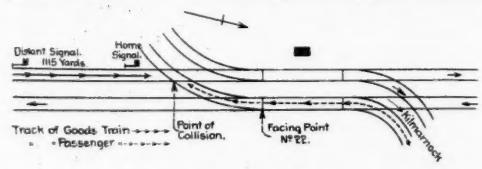


Fig. 2.—Collision at Barassie.

No. 22 straight for the main track he could have done this with perfect safety; he could have allowed both trains to come to his station simultaneously; but he thought that the passenger train would pass before the freight arrived, and so he made a clear road through for the passenger, depending on one home signal and one distant to stop the freight. But the freight was a light train, and it came on at about a mile a minute. The engineman was killed, and so it will never be known how he came to neglect the signals. There is, however, some evidence that the distant-signal arm drooped a little, so that the light appeared half red and half green; but the line is perfectly straight and the runner could have seen the home signal 3,345 ft. before reaching it; moreover, it was nearly daylight (7.13 a. m.). The engineman, Campbell, had been 20 years in the service, seven years an engineman; was steady, "of good education and ability and had always performed his duties successfully and without accident."

At Barassie, as at Dunbar, Colonel Yorke regards the signalman as the more to blame; "neither collision can be regarded as accidental. . . . Offenses of this kind need to be dealt with very severely, and it is due to the Glasgow & South Western to state that they have dismissed Norrie. . . . This collision directs attention to the advantages of the lock and block [Sykes] system." The Barassie collision was very disastrous, both trains having been running fast. Both firemen, one engineman and four passengers were killed.

At St. John's, on the South Eastern, March 21, a passenger train waiting at the home signal to enter the station was run into at the rear by a following passenger train, and two passenger cars were wrecked. Three persons were killed and 20 passengers were injured. In this case the Sykes lock and block apparatus was in use, but "not in a very complete form." Signalman Honey accepted the second train from the cabin in the rear (Parks Bridge) in the belief that the foremost train had passed him, while as a matter of fact it was standing outside the home signal, there being a dense fog at the time. Honey had other trains to attend to on other tracks, and about three minutes after accepting the first (the Tonbridge) train, having to throw certain other signals to danger, proceeded also to throw back to danger the main line signals which had been cleared only three minutes before for the Tonbridge train. Shortly after, the second (the Hastings) train was offered from Parks Bridge, and he accepted it. When he was doing this the boy employed in the cabin asked him what had become of the Tonbridge train, but Honey by this time had so convinced himself that the train had gone that he paid but little attention to the boy's warning. Even when the station master came, a little later, and said that there was a train waiting outside the home signal, Honey failed to realize the situation, and assumed that the Hastings train was the one referred to by the station master.

When Honey started to reverse the advance starting signal, after the supposed passage of the Tonbridge train, he found his lever locked, because the

train had not passed over the treadle (track instrument) controlling the lever; but this did not bring him to his senses; the treadle had failed several times two days before, and he therefore assumed that it was now out of order, and he proceeded to release it by an electric lock which is provided in the cabin for the purpose.

The Inspector, Colonel Addison, lays no blame on either train. Discussing the electric locking apparatus, he says:

"In a book issued by Mr. Sykes, I find it stated that, as a result of the adoption of the system, a signalman cannot 'accept a second train from the rear unless the first one has cleared his section.' The arrangements in force at St. John's evidently fall short of what is requisite to give this security. The occurrence under consideration strongly confirms an opinion frequently expressed by the inspecting officers of the Board of Trade, that the train should itself release the block instrument in passing over a 'treadle,' and going forward into the next section. At St. John's the release is effected by the signalman putting his signals back to danger, which does not insure the train having passed! The somewhat reckless way in which the signalman used the key, to release the back-lock of his advance starting signal, also calls attention to a weak point in the system, although it must be remembered it was not done until after he had wrongly accepted the second train. I am distinctly of opinion that it should not be in the power of a signalman to use the key without permission from another box [cabin], and there are several plans which have been proposed and tried, with this object in view; failing the adoption of one of these devices, the key should be so protected that it cannot be used without a record being left. I hope that the company will take the necessary steps to improve upon the present arrangements, in respect of these deficiencies."

Continuing, Colonel Addison says: The Sykes rules on the South Eastern vary from the Clearing House rules in two important particulars: First, a signalman may accept a second train as soon as the preceding train has passed; "no margin of clearance is fixed." The South Eastern "has no doubt carried on its heavy traffic under this rule with considerable success," but still the essential element of safe block working is the preservation at all times of an adequate interval of space between following trains. The Board of Trade holds that "it is not enough to start a train with a clear block section ahead of it; there should still be ample margin for overrunning signals when it arrives at the next cabin." Where fast trains are run, Colonel Addison is "unable to admit that any modification of the Clearing House rule is desirable"; if the traffic is so heavy that the rule cannot be worked the only conclusion is that the road "has not made sufficient provision for its traffic."

The second point is that in the South Eastern regulations signalmen do not send any "train entering section" signal. If Parks Bridge had been required to send this signal to St. John's, Colonel Addison believes the accident would not have occurred for it would have been sent just at the very moment when Honey was putting his signals back to danger. There is a distinct advantage in giving a reminder to the signalman ahead when a train does not go forward immediately after it has been accepted.

Honey had been on duty less than three hours, and "there is little, if any, excuse for his blunder." He bore a good character, however, and "displayed a thorough knowledge of the workings of this very busy and important cabin."

A number of other interesting cases are reported in the Blue Book before us. On the Great Northern, March 12, about 8 o'clock in the evening, a passenger train from Hatfield for London on a four-track line, ran past three cabins on the wrong track and was derailed by a derailing switch at the fourth cabin, Potter's Bar. The engineman was oiling the engine when the signal was given to start. He heard the arm drop and told the fireman to give the engine steam. At the first two cabins the signals were clear for both tracks; at the third his own was against him, but, acting on the other, he kept on his way. Just before reaching the danger point, an express train on the other track rushed by him, and he then applied the brake, but it was too late.

In this case the fireman failed to observe the signals because he was engaged in attending to his fire, "an excuse that is too often made in cases such as this to carry much weight." A word from him would have explained matters to the runner, and the Inspector, Colonel Yorke, regards him as inattentive to his duty. The two guards, who had been on duty 12 hours, also failed to take notice of any of the signals. "The information forthcoming at numerous inquiries seems to show that guards do not always sufficiently realize the responsibilities of their position."

At Achterneed, on the Highland Railway, on Sept. 25 last, a mixed train ascending a grade broke in two and the 10 rear vehicles ran back about six miles, doing no damage, however, except to break down the gates at a highway grade crossing. Of the 10 vehicles four were passenger carriages, but there was only one brake, and the guard could not control the speed. It appears that he thought the train was being set back to the foot of the grade, to be divided, on account of the inability of the engine to take the whole of it up the grade, so that he did not apply his brake until the runaway cars had attained a speed of about 10 miles an hour. The principal point discussed by the inspector, Major Marindin, in this case, is the make-up of the train. The road had been ordered by the Board of Trade to have continuous brakes working on all passenger cars in mixed trains, which means that such cars should be run next to the engine; and only five days before this accident the General Manager had written to the Board of Trade that the law would be complied with. Since the accident this has actually been done. The company has also decided to reduce the maximum load for engines on this grade. The coupling which gave way had a flaw which could not have been detected by any ordinary examination.

The failure of a masonry bridge at Porthkerry was noted in the Railroad Gazette of Sept. 23. A derailment near Tavistock, which Colonel Yorke could not explain, but which he suspected was due to the use of a heavy engine, liable to oscillate violently, on a track not strong enough for it, was reported in the Railroad Gazette of June 17, p. 436.

In the cases of the three collisions described above we have given the essential parts of the Inspectors' comments, so far as they are expressed in the reports. The American reader should bear in mind that the unexpressed part, the part taken for granted because the wishes of the Board of Trade have long been known, is that based on the rule that trains must not leave A for B until B has the road clear throughout the whole length of his yard; he must be able to clear his home, starting (and advance starting, if any), and distant signals before giving "line clear" to B. If he has no starting signal he must have a clear track 1,320 ft. (¼ mile) beyond his home signal. This idea is well settled in the minds of the Board of Trade people, and it is well settled in the Clearing House rules, which all the principal roads have adopted; but how faithfully these roads practice the rule is another question. We see that on two roads in the North it was suspended by the signalmen; whether or not with the deliberate consent of the officers of the road is an element of the question which the Inspector seems not to have probed very deeply. The rule is also suspended on the road in the South which uses the Sykes apparatus, and quite likely on the other roads (also in the South) which use Sykes apparatus. Mr. Sykes is an Englishman, and should know what respect ought to be paid to English opinion; but he has sent his apparatus to America without providing for the Clearing House protection (of two positive signals), and American railroads have accepted and used it. (We do not mean by this to imply that American railroads are not fully responsible for the decisions they have made.)

There have been collisions in this country, Atlantic City, for instance, which would have been prevented had the English Clearing House rule been in force; but we do not hear of any move to adopt that rule here. If it really is a necessary rule it ought to be adopted before and not after a large number of people have been killed. Lut, as some look at it, the railroad superintendent, whether English or American, who is convinced that this danger which the Board of Trade so persistently guards against is a serious one, is not by any means bound to take the Board of Trade's way of dealing with it. Assuming that the Englishmen are right in holding that a stop signal should not be depended on to stop a fast train (even when the approach to it is suitably guarded by a distant signal) there is no better way of meeting the problem than that which the inspector says should have been followed at Barassie; a switch should be so set as to divert the fast train just before it reaches the point of danger. The straight main line at Barassie, which the passenger train might have been run upon, is an ideal "derailer." If an American superintendent were compelled to conform to Board of Trade regulations he would undoubtedly provide such a track. If he could not afford the track he would try to satisfy himself (and the Board) with a track 100 ft. long; or, as is done now at innumerable crossings, he would have a track only 20 ft. long, or a mere "derail."

If we are to stick to sound theory the American idea is nearer right than the English. The theory of the home signal is that when at danger it always means stop at the signal, and nothing less; to let the engineman know that you expect them to disregard this meaning impairs all discipline. The English way of suspending the rule (to let A inform the engineman that the line to B is clear, "but station [at B] is blocked") is faulty, in that there is no mechanical or electrical check on the signalman. The code, with this regulation in it, virtually says to the engineman, in substance: Ordinarily a clear signal at A means that if you overrun the home signal at B no harm will ensue; only when the signalman gives an unusual, special signal need you regard the home signal as meaning what it seems to mean.

If we could not have derailers or diverging tracks (the American Railway Association Committee desires to include all derails in the term "diverging switches," so as to avoid giving the appearance that deliberately throwing trains into the ditch is a common occurrence) we should do much less violence to sound theory by providing two distant signals. Discipline, maintained with a reasonable degree of strictness, ought to make enginemen feel a sufficient respect for the second distant to stop before reaching it, if required by the rules to do so.

In view of the very good record made by the railroads of Great Britain during the past 25 years, we cannot assume that their enginemen are any more liable to overrun signals than are American enginemen; the evidence is the other way. Some American superintendents often feel an undefined desire to have derailing switches at every telegraph office and junction, it is so difficult to keep all their enginemen up to the desired standard of carefulness. At all events, if a single stop signal is not an adequate preventive of rear collisions, American railroad managers desire to have something better. Is our present record sufficiently good to justify us in dropping the whole English argument as not worth while? If we are to continue the use of "diverging switches" (derails), and to increase their use, should they be made into diverging tracks, in fact, so that no one can call them "ditchers"?

Annual Reports.

Louisville & Nashville.—The annual report for the year ending June 30 shows the highest gross and net earnings of the last five years and a surplus over all charges equal to nearly 3 per cent. on the stock. This might seem to justify the declaration of dividends, which have been suspended since 1893, but the large surplus is not to be held available for dividends, the President's report saying definitely that the accumulated surplus will not be used for that purpose, but further stating that the surplus earned hereafter above the fixed charges each year will be used as a basis for dividends for that year. The general results of operations for the last three years are summarized below:

	1898.	1897.	Increase.
Freight earnings	$15,854,802	$14,641,263	$1,213,539
Passenger earnings	4,557,729	4,291,735	265,994
Total gross	$21,996,653	$20,372,307	$1,624,346
Operating expenses	14,921,730	13,849,218	1,072,512
Net earnings	$7,074,923	$6,523,089	551,834
Per cent. expenses to earnings	67.84	67.98	*.14
Total net income	7,665,699	6,950,153	715,546
Interest and rentals	4,972,592	4,981,993	*9,401
Taxes	640,249	589,516	50,733
Loss on Ga. road, etc.	175,100	75,414	100,314
Sinking fund and bond discount	419,955	399,464	20,491
Surplus	$1,632,903	$979,180	$653,723

*Decrease.

It will be noticed that the net gain is less than a third of the gain in gross. The larger gain in the total net income than in net earnings is not due to increased income from investments, but to the inclusion in miscellaneous receipts of $154,773 rent from the Paducah-Memphis division, formerly deducted from interest account. If the credit had been made this year to that account interest would have shown a decrease of $164,173. The surplus above, $1,632,903, has been appropriated to various improvement reserve funds, as follows:

For couplers and air brakes	$500,000
For rolling stock	880,883
For grade reduction	248,441
Total	$1,629,324

With this amount the total held in reserve funds for similar purposes is $1,768,992, as shown by the balance sheet.

More than half of the increase in operating expenses is due to the maintenance of equipment account, as will be seen by the following changes in the classified items of expense:

	1898.	Changes.	
Conducting transportation	$7,555,951	I.	$550,205
Maintenance of way	3,183,166	D.	171,601
Maintenance of equipment	3,052,179	I.	668,034
General expenses	1,130,433	D.	25,873

The decrease in maintenance of way expenses is of no significance, for the expenditures in 1898 were still over $1,060 per mile of operated road. Since 1894 the company has had no construction account, the

betterment being included in expenses. The directors now say that the expenditures have brought the line and rolling stock into such good condition that the company will be relieved from very heavy betterment charges in the future. In 1898 the largest charges in the improvement account were $200,500 for air brakes and couplers, $99,000 for 16½ miles of side tracks; $77,000 for tunnels and bridge and trestle-work; $103,000 for new ballast, and $76,000 for new buildings and fencing, while $44,000 was also included as the excess cost of heavy rails laid in place of light sections. The rail renewals during the year included 293 miles of track, all but eight miles of 70-lb. sections. The company has undertaken important terminal improvements at Nashville. The company now has 88½ per cent. of its locomotives equipped with driver and train brakes; 23 per cent. of the freight cars have air brakes, and 39 per cent. automatic couplers.

There was an increase of 11,392 thousands or 8 per cent. in tonnage and of 1,737 millions in ton-miles, or 15.8 per cent., which was handled with a large improvement in economy, the revenue train-miles increasing only 6.9 per cent. and the train load gaining in the satisfactory figure of 15 tons, from 179 tons to 194 tons. A better carloading was obtained, and some progress was made in reducing the proportion of empty car mileage to the total car miles, which, however, must always remain large, on account of the nature of the company's traffic.

The Chicago & Alton has decided to abolish the use of gates on passenger cars. General Passenger Agent Charlton says: "The Chicago & Alton placed gates on its passenger cars commencing June 1, 1893, making it necessary for all passengers to show their tickets to be canceled before boarding the trains. The object was protection of passenger revenue, protection against accident, and securing that passengers boarded right trains and were provided with proper transportation. The new system did everything it was expected to do. Passenger revenue, especially on short-distance travel, was greatly increased. There has not been one single case of accident on car-gated trains since the system was adopted, nor has there been a single case of passengers boarding the wrong train The car-gate system on this line has been more effective and less expensive than the depot-gate system generally used in all large cities throughout the country. Our customers, however, are dissatisfied with it, and in deference to their views we have decided to abolish it." From a statement in the Grand Rapids Herald, it appears that the Chicago & West Michigan has also given up the use of gates.

The consolidation of the working forces of the fast freight lines operating over the New York Central and its controlled and affiliated roads, which was announced several weeks ago, went into effect on Oct. 1, and the changes in officers and agents are given in another column of this paper. The principal saving is in the reduction of the force of clerks at the general offices, and in rents. The number of soliciting agents dismissed is not so great as the men had feared, though many who are retained have had to accept lower positions. The number of clerks in the General Accountant's office, about 75, is only three-fifths as large as the number heretofore employed to do the same work. The saving in rents includes the abolition of all the general offices but one, and local offices in nearly or quite every city named in the list. We do not understand that any precise estimate has been made of the probable reduction in expenses, but a New York reporter quotes Mr. Depew as saying that it would be $300,000. This seems rather excessive; but it is possible that further changes may be made.

President Baldwin, of the Long Island, in his last annual report, says that the Huntington horse railroad was bought in April and equipped for electric working by trolley. The town of Huntington is situated from two to four miles from the railroad and its development has been hindered because of the distance from the nearest station. The service established by the electric connection has met the needs of the public, and this policy of building short electric roads as feeders to steam roads will be followed wherever such roads are needed. It has long seemed pretty obvious that such a policy is a wise one for the managers of the steam railroads. They are bound to lose business through the competition of electric roads, but it is apparent that business can be created or diverted to their lines by judicious feeders; and, furthermore, why should not the operation of electric railroads to be a direct source of revenue, as well as an indirect source, to the railroad companies in many different situations?

The Metropolitan Street Railway Association.

A year and a half ago we gave some account of the Metropolitan Street Railway Association, an organization which was started by the President of the Metropolitan Street Railway Company as a club, but which afterwards took on, besides its social features, certain mutual aid functions. Something of the present charcteristics of the Association can be gathered from the passages below, taken from a circular recently sent out to the members, from which it appears that in the year just closed dues were collected to the amount of nearly $14,000, and the total income was $22,800. Sick benefits were paid to the amount of $9,255, death claims $3,547 and medical fees $2,257. In the words of the circular, the Association is "a voluntary association of men banded together for mutual aid and improvement by the accident of a common employment, controlled by them and conducted in their interest alone. It has no salaried officers, its employees are limited to a single skilled physician, and it pays no rent. It has $5,000 invested in five bonds of the Metropolitan Street Railway Company, now worth $5,600, on which it draws annually $250 interest. It has $2,751.18 in the New Amsterdam Bank, and is daily growing in membership strength, which is now 2,604.

"For an initiation fee of $1 and dues of 50 cents per month you get $1 per day when you are sick, $150 in life insurance, free attendance by a thoroughly competent physician, whose whole time is devoted to the Association members. He is in attendance at the Association rooms daily from 11 to 12 o'clock and on Thursday evenings from 8 to 9 o'clock, where you can consult him. In case you are confined at home, he will visit you, and the Association druggist will furnish you medicine at reduced rates.

"You can, without charge, use the Association library, which comprises about 1,200 volumes by the best authors, and take its books home to be read if you do not wish to remain in the Association rooms."

The Association is managed by the President, who is the President of the Street Railway company; the Vice-President, who is elected by the members of the Association; the Treasurer, who is the Treasurer of the Street Railway company; the Secretary, appointed by the Board of Trustees, and the Board of Trustees. Of this Board three are appointed by the President and the other three are elected by the members of the Association.

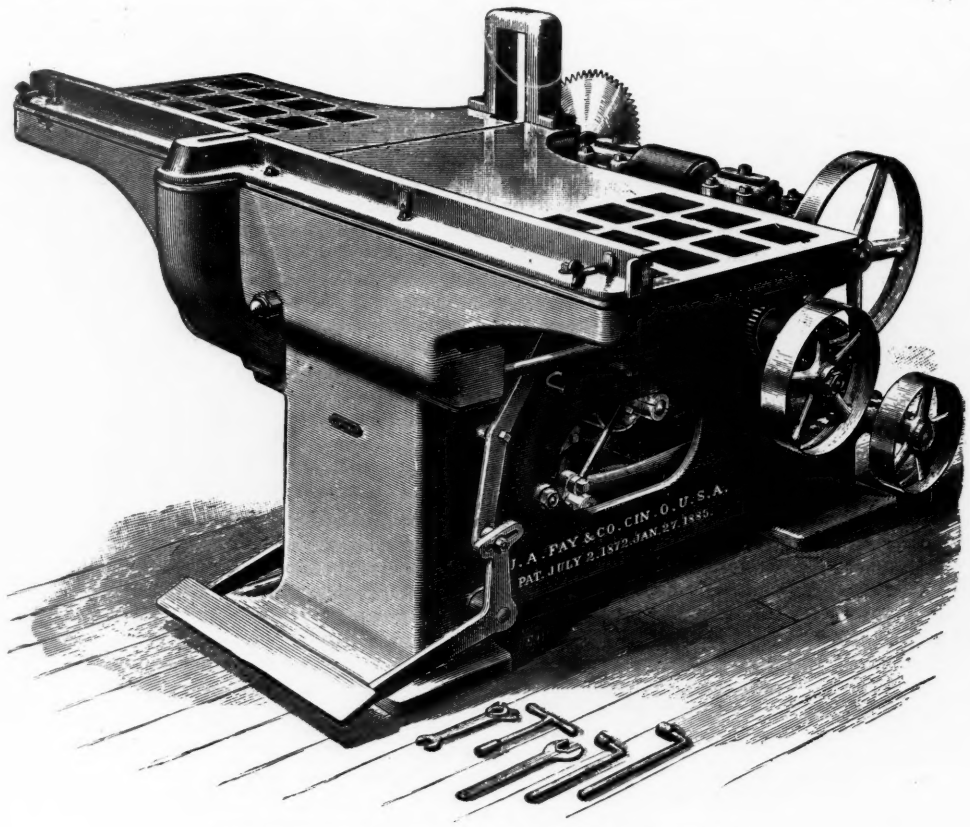
Last Saturday night we had an opportunity to see something of the evidences of the success and popularity of this Association on the occasion of its second annual public entertainment, which was held in Carnegie Hall, New York City. That great hall was packed from floor to roof with the members of the Association, their wives and children and sweethearts. It was their night, and they enjoyed it. The President made a short speech and then turned the meeting over to the committee of the Association which had provided the entertainment. To the outside observer it was very suggestive to see the signs of cordial sympathy between the President of the railroad company and his officers and employees, and to see this striking evidence of the success and popularity of an organization which began only about three years ago as a little club, meeting in a rough room over the old stables of the street car company. As we said in writing of this 18 months ago: "This one experiment will do more to kill socialism and populism and strikes and civil disorder than a cord of magazine and newspaper articles."

Automatic Cutting-Off Saw.

The saws of the type herewith shown are made by J. A. Fay & Co., of Cincinnati, and designed for cutting to accurate lengths all kinds of material used in shops, mills and factories. In building the machine particular attention has been directed to its requirements for heavy continued use. The saw is propelled back and forth by a double chain-feed, controlled by a foot lever in front. The frame is made of one heavy casting, with a large floor base. The guide-rails for supporting the traveling carriage are wide and heavy, and cast to the frame.

The arbor is $1\frac{3}{16}$ in. diameter where the saw is received, made of the best steel, and runs in a connecting gateway having self-oiling bearings. The end of the arbor is provided with a device for increasing the size, allowing the use of saws with varying sizes of holes without the necessity of bushing. The sliding gateway is actuated on the planed guides of the frame by feed mechanism, which, by simply pressing upon the lever that extends across the front of the base of the machine, causes the saw to travel in either direction, as may be desired. Adjustable stops are provided for regulating the distance the saw is made to travel in, to suit the different widths of material to be cut off. When using a saw 220 in. in diameter a piece of material 5 in. thick may be cut off. Saws up to 22 in. diameter can be used.

The table is made of iron, 60 x 23 in., and is provided with a board-measure accurately spaced in inches for the convenience of the machinist.



New Cutting-off Saw—Built by J. A. Fay & Co., Cincinnati, O.

TECHNICAL.

Manufacturing and Business.

The Hartley & Teeter light inspection cars, made by the Railway Cycle Manufacturing Co. of Hagerstown, Ind., are being widely used. The New York Central has just bought eleven of them for the engineering department. They are also in use on important railroads in nearly every country on earth where there are railroads.

The Russell Snow Plow Co. of Boston has received orders for Russell wing elevator snow plows, size No. 2, as follows: one each from the Grand Rapids & Indiana, the Chicago & West Michigan and the Detroit, Grand Rapids & Western. The plows for the last two named roads are to have Russell air flangers and are to be equipped with Westinghouse air brakes.

The Carborundum Co. of Niagara Falls, N. Y., has decided to enlarge its plant in Niagara Falls, Ont.

The Chapman Valve Co. of Indian Orchard, Mass., has declared a quarterly dividend of 3 per cent.

The Cincinnati Shaper Co. has been incorporated, with a capital stock of $50,000, to make machine tools, by Perrin G. March, S. W. Skinner, Wm. S. Rowe, Arthur Stein and Frederick A. Grier.

It is stated that the Coughlin-Sanford Switch Co. of New York, has leased a building from the Carlisle Mfg. Co. of Carlisle, Pa., to be used as a factory.

Mayor Johnson of Long Beach, Cal., has called the attention of the Board to the advisability of improving the lighting plant at a cost of about $13,000.

According to the Juneau, Alaska, Record, George W. Easterly is on his way to the United States to buy machinery and supplies for the electric lighting plant which he operates at Dawson. He is bound for Seattle.

Proposals for the installation of an electric light and power plant at the U. S. Naval Station, Puget Sound, Bremerton, Wash., will be received at the Bureau of Yards and Docks, Navy Department, Washington, D. C., up to Oct. 15. Specifications and blank forms of proposals may be had upon application to the Commandant of the U. S. Naval Station, Bremerton, Wash., or to the Bureau. The appropriation for this work is $9,800. Mordecai T. Endicott is Chief of the Bureau.

According to the Elko, Nevada, Independent, S. N. Miller et al. will utilize the power of Snake River for generating electricity; $100,000 is the amount estimated to be sufficient to build a plant and a line which will deliver from 1,000 to 5,000 h. p. at Tuscarora.

At the shop of Olney & Warrin of 45 Dey St., New York, are working models of locomotives in different stages of completion. One, just about finished, is for the Dickson Locomotive Works, being a working model of a narrow gage saddle tank locomotive for service in South Africa. All parts of these engines are made to scale, the links, eccentrics and reversing gear presenting a very pretty piece of work. The company takes orders for working models to be made according to any designs. Castings may be had either rough or finished, or the locomotive completed ready for service. These are used by inventors, by students of steam engineering, for advertising purposes, and for miniature railroads at pleasure resorts for hauling children.

The C. H. Haeseler Co., maker of the Phoenix pneumatic tools and appliances, has removed its factory to the southeast corner of Twelfth and Hamilton streets, Philadelphia, Pa. The company reports a good business and that it has received orders recently for a large number of improved pneumatic drills from the Baldwin Locomotive Works, Newport News Shipbuilding & Dry Dock Co. and the Wm. Cramp & Sons' Ship & Engine Building Co. The company has recently installed a complete pneumatic plant in the Brooklyn Navy Yard and has also supplied a number of tools to the United States Government for the Port Royal and Mare Island yards.

Iron and Steel.

The plan to rearrange the affairs of the Cambria Iron Co. has been modified. The capital of the new Cambria Steel Co. will be $16,000,000, and the holders of Cambria Iron Co.'s stock will be entitled to subscribe to two shares of the new stock for every share of stock now held and a dividend of 4 per cent. per annum will be guaranteed on the Cambria Iron. It also has been arranged to declare a scrip dividend of 6 per cent. on the Cambria Iron stock, which will be convertible into stock at a future date.

A Birmingham dispatch states that the Alabama Steel & Ship Building Co. has filed a first mortgage and deed of trust to the Manhattan Trust Company of New York. The mortgage is for $1,100,000 and provides for the issue of bonds to that amount to run 30 years at 6 per cent.

It is stated that more than two-thirds of the stock of the Illinois Steel Co. and the Minnesota Iron Co. has been deposited at the office of the Federal Steel Co.

A contract has been closed by which the Riter-Conley Co. of Pittsburgh will build the open hearth steel furnace plant for the Alabama Steel & Shipbuilding Co. at Ensley, Ala., which has been mentioned in these columns before. The contract calls for 10 50-ton "Wellman" rolling furnaces, the general dimensions being approximately 21 ft. wide, 37 ft. 6 in. long and about 22 ft. high above foundations. The order calls for everything above the foundations, which are now finished, a gas producer house and a storage bin 18 ft. wide and 343 ft. long, both of steel, being included. It is estimated that 2,000 tons of steel will be required for the whole work.

The Deckerville, Osceola & Northern will require 20 miles of rails for additional road to be built at once. E. M. Ford, Deckerville, Ark., is the Vice-President and Manager.

The Gulf & Chicago will need 25 miles of rails for the Pontotoc & Starkville, which is an extension to run from Pontotoc, Miss., to Starkville on the Illinois Central. J. W. T .Falkner of Oxford, Miss., is President of the Gulf & Chicago.

New Stations and Shops.

The Standard Contracting Co. of Cleveland, O., has been awarded a contract to build a large dock in Conneaut, O.

J. J. Hill, President of the Great Northern, is reported as saying that the company will build a freight house and several warehouses in Duluth.

Work is progressing rapidly on the shops which the Chicago Great Western is building at Oelwein.

Newspapers state that Cope & Stewardson, of 320 Walnut street, Philadelphia, are preparing plans and specifications for a new passenger station to be built at Ogontz Park by the Philadelphia & Reading, to cost $10,000.

The new station of the New York, New Haven & Hartford at Providence has been opened for traffic.

The Grand Trunk has recently awarded a contract to G. S. Germain of Port Huron for building a new roundhouse, with 30 pit stalls and two entrance tracks, in that city. The building will be of brick on stone foundations, with cast iron column supports. Adjoining will be a repair shop, boiler house and offices, also of brick. A new Grand Trunk standard 70-ft. turntable will be provided and the radius of the building from the center of the table to the outside face of the outside pilasters will be 169 ft. 3 in., the depth of the covered portion being 76 ft. 3 in. The buildings will be furnished with all latest improvements in the way of water supply, drainage, lighting, heating, ventilation, etc., the heating to be done by steam. The total cost will be about $60,000 or $65,000. The company has also let a contract for a roundhouse to be built at Sarnia by George A. Proctor of that place. This will be very much like the one for Port Huron and will cost about the same. It is expected that both houses will be completed by March 1, 1899.

It has been reported that the Wm. Cramp & Sons' Ship & Engine Building Co. will build a large shop. The company states that this report is not true, but that they are building a small blacksmith shop.

The citizens of Augusta, Ga., have petitioned the State Railroad Commission to compel the Georgia Railway to build a new passenger station. At a hearing held Sept. 20 the company asked for a continuance of the hearing until it could prove that it proposed to do in good faith all asked of it. The hearing was postponed for 30 days. We are advised by the company that no plans have yet been prepared.

We have previously stated that the Board of Trade of Mansfield, O., had asked the Pennsylvania, the Erie and the Baltimore & Ohio to consider substituting a union station for the three separate stations in use at that point, and that the matter was under consideration. W e are officially informed that there is no change in the situation up to the present time.

Nothing definite has been done relative to rebuilding the Central Railroad of New Jersey shops at Elizabethport. These shops were destroyed by fire some time ago.

Some time ago we stated that the Southern had under consideration the question of moving the Memphis and Charleston shops to Sheffield, Ala. We are now officially advised that no action has been taken and may not be this year.

The Canadian Pacific has bought additional land next to the burnt site of its depot and wharves at New Westminster and will build a new station, warehouses and wharves. Plans have not yet been prepared.

The Edge Moor Bridge Works have received a contract from the Pennsylvania to build sheds on Piers 13, 14 and 15, at the foot of Vine street, Philadelphia, two of which will be 189 ft. 4 in. x 55 ft., and the third 235 ft. x 118 ft., and for another shed on the Dock street wharf to be 109 ft. x 235 ft. This company has just finished for the Pennsylvania Company a shed on Piers 10 and 11, 231 ft. x 174 ft. 6 in. and a bulkhead shed adjacent to it, 97 ft. x 130 ft. These sheds are of steel framework covered on the sides with corrugated iron, the roof covering being slag roofing laid upon sheathing, with necessary skylights, ventilators, etc. The new sheds will be of similar construction to those just finished.

William Robinson has secured a contract for the foundation of a new freight depot to be built in Denver, Col., by the Union Pacific, Denver & Gulf. The plans call for a building 300 x 48 ft., the full width of which and 48 ft. of the length, will be two stories high, to be used as offices by the freight department.

It is reported that Geddes & Seerle have been awarded the contract for the building of the new Union Pacific depot at Omaha at a cost of $200,000. We have not been able to verify this.

The Des Moines, Ia., Leader states that plans for new car shops for the Chicago, Rock Island & Pacific, to be built at Valley Junction, have been received in Des Moines, and that the plans call for a car repair shop 400 x 210 ft., a car building shop 320 x 150 ft., a foundry 150 x 160 ft., and a paint shop; the total cost being estimated at $150,000.

It is reported that the Pittsburgh, McKeesport & Youghiogheny has had plans prepared for a new freight and passenger station to be built at Monessen at a cost of $15,000.

According to press dispatches, the Southern Pacific shops at Ogden are to be enlarged, necessitating the putting up of a new building, for which machinery will be moved from the repair shops at Carlin.

Newspapers state that the Pittsburg & Western has leased to the Buffalo, Rochester & Pittsburgh five acres of land in Pittsburgh, on which the last named company will build freight and passenger stations. We have not been able to verify this.

From the Seattle, Wash., Post Intelligencer we get the information that the Great Northern has taken out a building permit for a two-story brick building to be put up in that city. Up to the time of going to press we have not been able to find out what kind of a building this will be.

The Sacramento, Cal., Bee states that the Southern Pacific is building a new pattern shop in Sacramento.

The reported large coaling station to be built on land recently acquired in Evansville by the Cincinnati, New Orleans & Texas Pacific is to be an ordinary coal storage platform 210 ft. long and 60 ft. wide, supplied with coal from an elevated trestle. The work will be done by the company's force.

It is stated that plans have been completed for a new Chicago, Burlington & Quincy passenger station to be built at Fort Madison, Ia., to cost $12,000.

It is being reported generally that the Toledo & Ohio Central will immediately build a new station at Toledo. We are advised by the company that it does not expect to build such station this year, and that no plans have been prepared.

According to report the Southern will build a new freight house and extend its yards in Louisville.

Interlocking.

The Standard Railroad Signal Co. has taken a contract to build an interlocking plant for the Cleveland, Cincinnati, Chicago & St. Louis at Springfield, O. The Standard Co. has just finished putting up the signals at the crossing of the Terminal Railway of Buffalo with the Western New York & Pennsylvania at Ebenezer, N. Y.

A Compressed Air Switching Engine.

In the Topeka yard of the Atchison, Topeka & Santa Fe Railway a compressed air motor has been used for several years for shifting purposes. The air reservoir is a simple drum, with a capacity of 167 cu. ft., and the air is carried at a pressure of from 75 to 85 lbs. The drum is placed on a frame, to which a pair of small engines, formerly used on a coal digger, is attached. These engines are geared to one axle under the frame which carries the drum. This switcher can handle two loaded cars or a dead locomotive anywhere in the yard. The apparatus was a makeshift, but it obviates the necessity of using a switch engine and crew. Any train man can handle it.

Locomotives in Japan.

In a recent issue, Engineering (London), prints some notes on the American and British locomotives in Japan. Two years ago practically all the locomotives in Japan were imported from Great Britain. In 1896 out of 175 locomotives used on the Tokaido line, there were only six of American build. The latest returns show that more than 70 such are now in use. One reason is cheapness and another promptness of delivery. An American locomotive costs, including freight, 19,000 yen, and a British locomotive 24,000. Japanese newspapers say that an order for 40 engines sent to England in 1896 has not yet been filled, while orders sent to America are carried out in a very short time. The Secretary of the British Legation in an official report, says that British locomotive builders require two years to deliver a large order, while the Baldwin Locomotive Works turned out engines at the rate of two a day and shipped the whole quantity in eight or 10 weeks. In another recent case the British time for shipment of five locomotives was 10 months and the price $12,000 gold, delivered in Japan. The American builders offered to ship in 14 weeks at about $8,000 gold. The specifications sent to the two countries were identical. On the other hand, the Consul thinks that there is no doubt in the minds of the Japanese as to the superiority of the British engines. Extensive experiments are in progress, and he says that it has been made clear that the American engines consume more coal and that the British materials of construction are better.

Steam Blast for Cleaning Locomotives.

The Illinois Central for some time past has made a practice of placing a steam valve on the domes of locomotives for connecting a hose, so that steam may be used for thawing ice and snow from around the motion parts and driving boxes when locomotives come in from a run in winter. This is done outside, so that the engines are comparatively clean when they reach the roundhouse, which can, therefore, be kept in good order. In summer the steam blast is occasionally used to clean off dust and dirt from the working parts.

Oiling the Track.

In the annual report of the Long Island Railroad for the year ending June 30, we find an item of $4,484 for 73.4 miles of oiled track. The average is, therefore, $61 a mile. This is somewhat less than the figure heretofore given to us as the cost per mile of oiling ballast.

Steel Freight Trucks.

The Mexican Central Railway is investigating the question of the use of cast steel instead of channel iron in the construction of freight car trucks. It is probable that the next lot of cars ordered by that company will have the steel truck which was shown in the Railroad Gazette of June 4, 1897.

Heavy Track on the Continent.

The adoption of heavier track makes way in Germany as well as here. On one of the main lines in Wurtemberg the work of renewing 160 miles of track, begun in 1895, has recently been completed, at a cost

of some $1,750,000. The old rails were 29½ ft. long, weighing 66 lbs. per yard; the new ones weigh 87 lbs. per yard and are 39 ft. 4 in. long. The new steel ties weigh 155 lbs. each and there are 16 or 17 of them to each rail length, while the old ties weighed 114 lbs. each, and 10 to 12 of them were laid to a rail length—that is, in the new track the ties are spaced 2 ft. 6 in. and 2 ft. 4 in. center to center; in the old track they were 3 ft. and 2 ft. 6 in. The whole weight of the superstructure (rails and ties) was 266 to 278 lbs. per yard in the old road, and is 408 to 422 lbs. in the new.

A Tandem Compound for the Atchison, Topeka & Santa Fe.

The Atchison, Topeka & Santa Fe has built a heavy tandem compound consolidation freight locomotive at Topeka, with which trials are now being made on the mountain divisions. The principal dimensions, with the exception of the cylinders, are the same as those of the single expansion consolidation locomotives, a number of which have recently been built at the Topeka shops, and others by the Dickson Manufacturing Co. A description of the simple engines was published in our issue of June 10 last. This is the first tandem compound built since 1892, when the Brooks Locomotive Works built two for the Great Northern. While the type has never been popular in this country, it has been used quite largely in the continental countries of Europe.

The New Coast Defence Monitors.

Contracts for the four new coast defence monitors, Arkansas, Connecticut, Florida and Wyoming, have been awarded one each to Lewis Nixon of Elizabethport, N. J., for $825,000, to be built in 24 months; Newport News Shipbuilding and Dry Dock Co., Newport News, Va., for $860,000, in 27 months; Bath Iron Works, Bath, Me., for $862,000, in 27 months; Union Iron Works for $875,000, in 27 months. These ships will be 225 ft. long, and 50 ft. beam; will draw about 12½ ft. of water, and will have a displacement of 2,700 tons. The batteries will consist of two 12-in. guns, four 4-in. rapid fire guns, and seven smaller caliber rapid fire guns. The builders are not required to furnish guns, armor or turrets. The turrets will be of the balanced type, 10 in. thick behind 11 in. barbettes, and a belt of armor 11 in. thick and 5 ft. broad will be placed on the sides of the vessels.

Chicago Public Works.

The Chicago Board of Local Improvement, on Sept. 21, passed ordinances for building 10 miles of sewers and paving 15 miles of streets. This work will cost about $700,000, and will be paid for by special assessment. The meeting of the Board was public and many taxpayers were present to protest against the improvements, but in most cases objections were overruled on the ground of public necessity. The new sewers will be built principally in the north and northwest sections of the city. The new pavements are to be of cedar, asphalt, macadam and granite. Contracts were let Sept. 20 for paving North Clark street, from Division street to North avenue, and North State street, from Kinzie to Division, with asphalt, to the Barber Asphalt Co., at 2.15 cents per cubic yard. The contractor is under bonds to complete the work this Fall.

Dredging at Waukegan.

The Detroit firm previously mentioned in these columns as having the contract for dredging the harbor of Waukegan, Ill., declined to accept the contract, which was re-let Sept. 21 by the City Council of Waukegan to the Lake Michigan Dredge Company, of Milwaukee. We are informed by the President of the latter company that work will be commenced in about two weeks, the channel to be 18½ ft. deep, 60 ft. wide part way and 120 ft. wide part way. Also, that the contract calls for the completion of the work by May 1, 1899.

The New Torpedo Boats and Destroyers.

Contracts for the new torpedo boat destroyers have been let as folows: William R. Trigg of Richmond, Va.; Fore River Engine Company, of Boston, and the Harlan & Hollingsworth Company of Wilmington, two each; the Maryland Steel Company of Baltimore, Neafie & Leavy of Philadelphia, and the Union Iron Works of San Francisco, three each; the Gas Engine & Power Company of New York, one.

The torpedo boats as follows: Columbian Iron Works of Baltimore, and the Gas Engine & Power Company of New York, one each; George R. Lawley of Boston, and Lewis Nixon of Elizabethport, N. J., two each; W. R. Trigg of Richmond, Va., and Bath Iron Works of Bath, Me., three each. The award to the Bath company is subject to conditions.

New Gas Engine Motor for Suburban Work.

Recently there was completed at the Sixty-fifth street station of the Brooklyn Heights road a gas engine motor designed and built under the direction of Mr. T. D. Hoskins, whose city office is at 203 Broadway, New York. The entire equipment is placed beneath the car body and weighs complete about 3,000 lbs. Two 30-gallon tanks provide sufficient cooling water for the cylinders and one 30-gallon tank contains the gasoline which at present is used for the motive power. The engines when once started at the car house are supposed to be kept running during the entire trip, connection between the main shaft, which is driven directly by the engine, and the car wheels being made by means of a friction wheel about 8 in. in diameter and 10 in. across the face. There are, however, two of these idle wheels, one placed directly above the other. The direction of motion of the car is determined by the position of the controller handle, by menas of which either wheel can be thrown in contact with the friction wheel on the engine shaft and the one on the car wheel. The engines were designed particularly for this work by Mr. Hoskins, and have a cylinder each of 6 in. with 12 in. stroke. They are exploded by means of an electric igniter at each second stroke and the ignitions can be regulated by means of a switch within reach of the motorman at either end of the car. The movement of the car is regulated by means of a handle in place of the controller of an ordinary electric car, the movement of which places the idle friction wheel in proper contact. The fly wheels, two in number, weigh about 500 lbs. each and are about 3½ ft. in diameter. The car can be seen at Sixty-fifth street and Third avenue, Brooklyn, or at the car house near there.

A Consolidation of Signal Companies.

For some weeks negotiations have been in progress towards the practical consolidation of the Union Switch & Signal Co. and the National Switch & Signal Co. It is now publicly announced that a meeting of the stockholders of the Union Switch & Signal Co. has been called to be held Dec. 13. The call states that the object of the meeting is to vote on an issue of $500,000 in 5 per cent. gold bonds to provide the funds for, and to ratify the purchase of, the entire capital stock of the National Switch & Signal Co. The present officers and employees of both companies will be retained in the main. Naturally, there will be some changes in the staff, but the number employed will be reduced little, if at all.

Steel Castings for Warships.

The American Steel Casting Co. at Chester, Pa., is just about starting on the steel cast shapes required in building the hulls and engines for the Russian battleship and cruiser now on the stocks in this country. Many of these shapes are the most intricate ever attempted in cast steel. Although they are nearly of the same design as those used in the latest battleships built for the United States, they have been considerably lightened in weight.

THE SCRAP HEAP.

Notes.

The Pennsylvania Railroad, which runs cabs to and from its stations in New York and Philadelphia, is preparing to establish a similar service in Washington.

Another one of the large department stores in Chicago has built a passageway from its second story to the platform of the Union Elevated loop, the connection this time being on Van Buren street, near State street.

The shops of the Philadelphia & Reading at Reading, Pa., are now running full time, and some departments are running 20 hours a day. The shops of the Pittsburgh, Fort Wayne & Chicago at Fort Wayne, are rnning 10 hours a day.

A South Carolina paper says that the Southern Railway, to avoid running separate cars for negroes, will put vestibuled cars on nearly all its trains. The law of the state, which recently went into force, excepts vestibuled trains from the rule requiring equal and separate accommodations for the white and black races.

A Washington dispatch of Sept. 30 states that the Commissioner of Internal Revenue has suspended the order holding that railroads must pay a revenue tax of two cents on each rebate check issued by passenger conductors. The question of the application of the war revenue law to rebate checks has been referred to the Attorney-General.

Under the offer of the Illinois Central Railroad to sell the stock of the company to employees at the market rate, to be paid for in installments, 2,536 shares have been sold. The number of employees holding these shares is 733. This quantity of stock is equal to less than one-half of one per cent. of the total share capital of the road.

On Friday of last week the striking coal miners at Pana, Ill., gathered in a mob on the track of the Baltimore & Ohio Southwestern, a few miles east of the town, and forcibly stopped a passenger train carrying two carloads of negroes to take the places of the strikers in the mine. Most of the participants in the outrage were masked with handkerchiefs. They made the trainmen run the principal part of the train forward some distance and then compelled the negroes, who were in the two rear cars, to get out and walk back to the next station. Thence the strikers paid the fares of the terrorized negroes back to Washington, Ind.

The Governor of Michigan has failed in his efforts to compel the Michigan Central Railroad to sell family mileage books at 2 cents a mile. The State Supreme Court decides that the Michigan Central's special charter unquestionably confers the right upon the company to fix its own tolls, and that this is a vested right which cannot be withdrawn by the state without an adequate compensation therefor. The court also decides that a law passed by the Legislature of 1891 limiting the price of mileage books to 2 cents a mile has no application to the Michigan Central, and that the only way to effect the change desired by the Governor is to have the Legislature amend the charter of the company, which means that the state must compensate the company for any damage involved.

On the night of Sept. 26 a freight train on the Lake Shore & Michigan Southern was boarded by robbers near Elyria, O., and the conductor was robbed of his watch and money at the muzzle of a pistol. The next night there was a similar robbery near North Amherst, O., on the same road, the robbers getting considerable money and other valuables from about 20 ride-stealers who were on the cars. A press dispatch from Cleveland, Sept. 28, reports that two men held up Lake Shore passenger train No. 72 about 25 miles west of that city at one o'clock in the morning and robbed all of the 25 passengers in one car. This dispatch seems to be a fiction, suggested by the robbery on the freight train. Near Husted, Col., on the night of the 28th a passenger train of the Denver & Rio Grande was attacked by robbers, but the trainmen put them to flight. About 30 shots were fired. The express messenger stuck to his post while dynamite was being exploded beneath his car.

The Washington correspondent of the New York Evening Post sayr that the Congressional Committee which is investigating the management of the Post Office Department is likely to recommend that no further contracts be made for pneumatic mail tubes between post offices and railroad stations in cities. The tubes now in use in Philadelphia and New York are used only for letters, and as the wagon service has to be maintained to carry the newspapers there is no saving in expense; the tube service is simply a luxury, saving a little time. Between the new Congressional Library and the Capitol at Washington there is an underground passage for the conveyance of books, which is worked by a small car. Something like this, which will carry whole sacks, is desirable for the mail service. The committee finds that the uniformity of salaries for post office clerks, which is required by law, works to the detriment of the service. At Montgomery, Ala., and other places in the South, the prescribed salaries are much higher than is necessary to secure efficient clerks; while in Montana and other Western states it is impossible to get good men for the wages offered by the Government. Instances are cited where clerks in stores get five times as much pay in Montana as is paid for the same grade of work in certain places in South Carolina.

Vancouver to Vladivostok.

A press dispatch from Vancouver, B. C., says that the Canadian Pacific will soon have two steamships, the Tartar and the Athenian, of over 4,500 tons each, running between Vancouver and Vladivostok, Siberia. The first ship will carry lumber and rails for the Siberian Railroad.

Something That May Perhaps Be Done.

The serious effects of rate cutting are manifest. Much of this loss can be eliminated outside of work to be done at the National or state capitals, and at no time has the opportunity been as propitious as now. The reorganization of a number of the great railroad systems has centered the virtual control of many thousands of miles and of many trunk lines in a few hands. The small group of men who can dictate the policy of so large a part of our 185,000 miles have a responsibility which justifies them in exercising it without fear or favor. They have put many bankrupt concerns on their feet. They have so arranged the plans of capitalization and bonded debt as to inspire great hope for the future, and confidence in the ability of the roads to meet their obligations. Now these people have it in their power to do a great service to stockholders and to the public, and to lay a broad foundation for the confidence of our own capitalists and investors, and of the foreigners. We believe that the presidents of our leading systems will heartily co-operate in any practicable plan for fixing rates which shall be remunerative and yet reasonable. We believe that Messrs. J. P. Morgan & Co., for instance, could secure the assistance and support of many of the leading presidents in carrying out a schedule of rates which would become the standard for the country, and would be out of the power of either subordinates or of inferior competitors to disturb. Looking at the question from every side, we believe this is the thing to do; we venture to hope that it is already in contemplation and progress.—Davis' Circular.

The Reading's Fast Train to Atlantic City.

Mr. Basford, the editor of the American Engineer, has taken a ride on the fast train of the Atlantic City Railroad from Camden to Atlantic City, N. J., and prints some interesting notes of the trip. The engine was No. 1,028, which has valves 12 in. in diameter, one inch larger than those of No. 1,027, which hauled the Atlantic City train last year and which was described in the Railroad Gazette, June 19, 1896. The very fast schedule of this train (64 miles an hour for 55½ miles) is familiar to our readers from accounts published last year. (Aug. 13, p. 571.) The fastest time made on Mr. Basford's trip was 84.2 miles an hour for a single mile (42¾ seconds). The time for the whole trip was 47½ minutes. The fastest trip that has been made this season was 44¾ minutes, or at the rate of 75.3 miles an hour. The engine has drivers 84½ in. in diameter. It rides smoothly, there being no difficulty in reading a stop-watch without standing up. The fuel used was Tunnel Ridge anthracite coal and the steam pressure did not vary more than three

pounds from 205 lbs. during the entire trip. The throttle was not open far and it was not changed during the run; and but one change was made in the boiler feeding; the right hand injector was used for the first half and the left hand for the last half of the trip. The cutoff was 10 in. in the high pressure cylinder. The water evaporated was about 54 lbs. a mile and the quantity of coal burned during the entire trip was about two tons. The engine steamed freely and the fireman did not have to work very hard. The grate area is 86 sq. ft., and Mr. Basford thinks that the engine was not worked nearly up to its limit.

Special Trains from Chicago to Omaha.

On Friday, Sept. 29, four heavy special trains were run from Chicago to Omaha, carrying about 800 officials and prominent residents of Chicago to represent that city on "Chicago Day," Oct. 1, at the Trans-Mississippi Exposition, The first train went over the Chicago, Burlington & Quincy, carrying a party numbering 500 in 17 Pullman cars. The second train went over the Chicago, Milwaukee & St. Paul, and had 12 cars. The third train went over the Chicago & Northwestern, and was made up of 10 cars. Passengers on this train were supplied with transportation books with covers of white satin, lettered in gilt and containing tickets for transportation, dinner, admittance to the Exposition, etc., and so bound that the covers may be retained as souvenirs. The fourth train ran as the second section of the third. The passengers on these four trains were the members of the City Government, of the Board of Trade, and of the Union League and other clubs, and the souvenirs referred to indicate the luxurious arrangements, not only on that, but on all the other trains. The train over the Burlington, with theCook County Democracy, consisted of seventeen Pullman cars, one special private car, one baggage car and two engines. It measured 1.377 feet, or more than a quarter of a mile long.

The Providence Passenger Station.

The new union station at Providence, heretofore described in the Railroad Gazette, was opened for use on Sept. 18. The Providence Journal of that date had a two-page description of the building with a history of the negotiations between the city and the railroads during the past 25 years, leading to its construction. The article contains portraits of President Clark, General Manager Chamberlain, Engineers Dawley and Francis, and Alfred Stone, the architect. It is stated that arrangements have been made for running street cars up to the main entrance of the station on a level with the main floor. At present passengers reaching the station by street cars have to ascend steps from Francis street, which runs beneath the station and the railroad tracks.

Inspection of the Pennsylvania Railroad.

The annual inspection of the Pennsylvania Railroad, East and West of Pittsburgh, began Sept. 29 by a trip to Cape May and Atlantic City, and on the 30th the inspection party went to Long Branch and South Amboy. From the 3d to the 6th of October the time was devoted to the inspection of lines in Pennsylvania, east of Pittsburgh and Erie, and from the 16th to the 22d of October the lines west of Pittsburgh will be visited. The party consists of President Thomson, the Board of Directors, the Vice-Presidents and principal officers of the company, and on the inspection of the Western lines the officers of the Pennsylvania Company. The party is in charge of Mr. Lewis Neilson, Assistant Secretary.

A Mass Meeting of the Brotherhoods.

Representatives of the Brotherhood of Locomotive Engineers and the brotherhoods of firemen, brakemen, conductors and telegraphers have aranged for a mass meeting in Chicago, Oct. 20 and 21, at the First Regiment Armory, in connection with the "Peace Jubilee," to be addressed by President McKinley and others.

The South Side Elevated, Chicago.

Traffic for September averaged 46,576, an increase of 4,806 over August and of 16,509 over September, 1897. This gain is considered good for a month when open surface cars and bicycles are still in use. It is stated that stations north of Thirty-ninth street and nearer the business district gave a large part of the gain. This road began using the elevated loop Oct. 18, 1897. The following table gives the traffic record since that time:

Months.	1897-98.	1896-97.	Inc.
November	54,295	36,932	17,362
December	56,425	39,848	16,577
January	52,117	35,290	16,827
February	52,682	35,737	16,945
March	54,827	35,515	19,312
April	54,148	34,733	19,415
May	49,458	32,803	16,655
June	45,427	29,612	15,815
July	44,148	27,061	17,087
August	41,770	27,074	14,696
September	46,576	30,067	16,509

A Canadian Transmission Plant.

The work of conducting power from the Sooke Mountains, 18 miles from Victoria, in Canada, for the street car line and the illumination by electricity of that city has been completed. About 700 ft. above the sea level and 16 miles from Victoria, these waters form a lake covering 150 acres, into which empties Goldstream River, which is tapped three miles from its source by an artificial lake or reservoir covering 7½ acres, 1,122 ft. above sea level. From this reservoir the water passes through a steel pipe, 33 in. in diameter, 6,700 ft. to the power house of the electric company, which is 460 ft. above sea level, thus giving a fall of 1,000 ft. from the main lake, and through which 15,000,000 ft. of water pass every 24 hours, and forming 1,500 h. p.

A Proposed Mountain Railroad in Massachusetts.

Mr. C. J. Day of Greenfield, Mass., has completed a second survey for a proposed railroad to run from the South Deerfield and Sunderland road to the top of Mt. Sugar Loaf. The elevation is about 500 ft., and the length about 1,000 ft. Mr. Dwight Jewett of South Deerfield is the owner of Sugar Loaf Mountain.

Technical Schools.

The entering class of the Rensselaer Polytechnic Institute, Troy, N. Y., numbered at the beginning of this month 48, which will probably be increased to 50 when all who intend to enter have applied. This is about 20 per cent. more than entered last year. Prof. P. C. Ricketts, Director of the Institute, states that during the last 30 or 40 years the number of students has been governed largely by the financial condition of the country.

The entering class of the Rose Polytechnic Institute, at Terre Haute, Ind., is 45, an increase of 12 over last year's class. The present indication is that of this number 10 will be in the civil engineering and eight in the chemical courses, two in the agricultural and the remainder divided between electrical and mechanical. As the student is not required to make a choice of his course before the third term of the freshman year, these numbers may be changed.

In addition to the general information already printed regarding the opening of Purdue University, the following figures may be of interest: The freshman class numbers 160, which is about 15 per cent. larger than the entering class last year. Of those who entered 54 registered in the department of mechanical engineering, 36 in electrical engineering and 27 in civil engineering.

The total undergraduate applications to the University of California up to the first of this month were 546. Sixty-four applications are pending, 34 have been withdrawn, so that the total admitted was 448. Of this number there are 74 special students; 41 are taking the limited course and 333 the regular course. In the engineering department the following numbers have been registered: In mechanics 42, mining 47, civil engineering 13. Since the above list was published there have been admitted about 27 graduate students, 35 regular and limited, and 27 special students.

Prof. R. E. Chandler, last year Adjunct Professor of Drawing and Machine Design at the University of Nebraska, will take charge of the Department of Mechanical Engineering at the Oklahoma Agricultural and Mechanical College at Stillwater, O. T. Prof. Chandler graduated at the Stevens Institute of Technology in 1893 and soon after was called to the Agricultural College at Bozeman, Mont., where he built up a strong course in mechanical engineering. In 1896-7 he took up special studies at Cornell University, after which he was called to the University of Nebraska.

The fall quarter of the University of Chicago opened Oct. 1, with an unusually large attendance, especially in the undergraduate department. Although the registration is not yet completed, it is estimated that the total will be almost 1,400.

The University of Illinois, at Champaign, reports an attendance of 150 in excess of last year. The new class, in all departments, numbers over 500, and the total registration will be over 1,700.

At Cornell University the total registration is between 1,800 and 1,900, which is the same as last year.

LOCOMOTIVE BUILDING.

It is reported that the Oregon Short Line has asked bids on nine heavy locomotives for freight service.

The Baldwin Locomotive Works have received an order for one locomotive for the Hawaiian Electric Rd., a narrow gage road.

The Flint & Pere Marquette is considering buying some new locomotives, but we are officially informed that the matter is not definitely determined.

The Gulf & Chicago Railroad will want one engine for use in connection with the Pontotoc & Starkville Railroad, now being built as an extension of the former company.

The Atlantic, Valdosta & Western has ordered two American type locomotives from the Baldwin Locomotive Works, in addition to those recently ordered, and noted in this column.

The seven additional locomotives ordered from the Schenectady Locomotive Works by the Northern Pacific, as noted last week, are Class Y consolidations, making 14 in all of that class. The first seven, referred to in our issue of July 22, will be finished about Oct. 15.

In our issue of Sept. 16 we noted an order for one engine placed by the Detroit & Mackinac with the Pittsburgh Locomotive & Car Works. It is now reported that the road needs several more locomotives and will buy one at a time, the first to be ordered in the near future.

The note regarding the locomotive order of the Wiggins Ferry Co., in our issue of last week, was in error in stating that the Cooke Locomotive & Machine Co. did not receive this order. We are now informed that two engines were ordered, one from the Cooke Locomotive & Machine Co., and one from the Baldwin Locomotive Works. Both are six-wheeled switching locomotives.

The Schenectady Locomotive Works have just turned out one of a number of mogul freight engines for the New York Central & Hudson River which weight about 142,000 lbs. each, with 123,000 lbs. on the drivers. This engine, No. 786, has hauled 80 cars of grain from DeWitt to West Albany, being helped by a pusher over the grade at Schenectady. It has hauled a train of 125 empty cars westbound.

The Iowa Central has ordered two simple consolidation locomotives from the Baldwin Locomotive Works. These engines will have cylinders 21 in. in diameter, and 26 in. stroke; driving wheels 54 in. in diameter; total weight, 154,000 lbs., of which 140,000 lbs. will be on the drivers; improved Belpaire boilers, fireboxes 111⅝ in. long and 41¼ in. wide, a working steam pressure of 180 lbs., and tank capacity for water of 5,000 gals., New York air brakes, Nathan injectors. Chas. Scott Spring Co.'s springs will be used.

The Brooks Locomotive Works are building three consolidation engines with 19 in. x 30 in. cylinders and 55 in. driving wheels for the Oregon Railroad & Navigation Co. They will weigh 150,000 lbs., with 134,000 lbs. on the drivers and have Player's patent Belpaire type of boilers; working steam pressure, 200 lbs.; firebox, 113 in. long and 41¼ in. wide; tank capacity for water 4,500 gals.; coal capacity, 10 tons. The engines will be furnished with New York air brakes, hammered iron axles, Monarch brake beams, Diamond S brake shoes, Monitor simplex injectors, Jerome piston rod and Brooks Locomotive Works' valve rod packings, Leach sanding devices, Nathan lubricators, French springs, cast steel wheel centers and Brooks Locomotive Works' piston valves.

There has just been turned out from the Pittsburgh Locomotive Works a consolidation engine for the Union Railroad, the Pittsburgh end of the Pittsburgh, Bessemer & Lake Erie, which, according to the Pittsburgh Post, is heavier than any other engine ever built. From a description in the Post we copy the dimensions given below, and have added those of the Class H5 engine of the Pennsylvania Railroad and the 12-wheeler for the Great Northern, which were described in the Railroad Gazette of Jan. 7 and June 10 last:

	Union.	Penn.	Gt. Northern.
Cylinders	23x 32 in.	23½ x 28 in.	21 x 34 in.
Firebox	10 ft. x 42 in.	10 ft. x 40 in.	10 ft. 4 in. x 40½ in.
Weight	220,000 lbs.	208,000 lbs.	212,750 lbs.
Weight on drivers	200,000 lbs.	186,000 lbs.	172,000 lbs.
Drivers, diam..	54 in.	56 in.	55 in.

The Baldwin Locomotive Works have recently delivered to the Fitchburg Railroad two 10-wheel passenger locomotives, one compound and one simple. These locomotives are guaranteed to haul a train of 325 tons of cars and load up a grade of 60 ft. in a mile, 10 miles long, at 40 miles an hour The compound will have 15 and 25 x 26 in. cylinders and weigh 150,000 lbs., with 111,000 lbs. on the driving wheels. The simple engine will have 21 in. x 26 in. cylinders and weigh 147,500 lbs., with 110,500 lbs. on the drivers. In other respects the engines will be built on the following specifications: Boiler, 60 in. in diam.; working steam pressure, 200 lbs.; fireboxes, steel, 120⅝ in. long, 41¼ in. wide and 76$\frac{3}{16}$ in. deep, at front, and 61$\frac{1}{16}$ in. deep at back; tubes, 328, diam., 2 in., and length 15 ft. 1 in.; heating surface, firebox, 172.37 sq. ft.; tubes, 2,576.1 sq. ft.; total, 2,748.47 sq. ft.; grate area, 34.48 sq. ft.; driving wheels, diam., outside, 78 in., diam. of center, 72 in.; journals, 8½ in. x 12 in., wheel base, driving, 14 ft. 6 in.; total engine, 26 ft. 3 in.; total engine and tender, 53 ft. 2 in.; tender wheels, 26 in. in diam.; tank capacity, for water, 4,500 gals. The Baldwin Locomotive Works are also rebuilding four consolidation locomotives for the road and changing them into Vauclain compounds. When finished they will have 15 and 25 in. x 24 in. cylinders, and 56 in. driving wheels; boilers, 64 in. in diam., straight top type; fireboxes, 101 in. long and 42 in. wide; heating surface, about 1,850 sq. ft.; weight on driving wheels, about 116,000 lbs.; total weight, about 134,000 lbs.

CAR BUILDING.

The Norfolk & Southern is about to order 100 freight cars.

The Hammond Packing Co. is considering buying from 75 to 100 refrigerator cars.

It is stated that the Pennsylvania is building at its Altoona shops 20 cars for carrying live poultry.

The Gulf & Chicago Railroad will buy four coaches and one express and baggage car. (See Locomotive Building column.)

The Columbus, Hocking Valley & Toledo has placed the order for the 100 flat cars, referred to in our issue of Sept. 23, with the Ensign Mfg. Co.

The Santa Fe Fruit & Refrigerator Line is about to order 250 refrigerator cars, and it is reported that the order will go to the Wells & French Co.

In our last issue we referred to an order for 2,000 cars given by the Pennsylvania Railroad to various car companies. Those to be built by the Terre Haute Car & Manufacturing Co. are for November delivery, and will be 35 ft. long, with steel axles, pressed steel bolsters, National hollow brake beams, Christie brake shoes, Westinghouse air brakes, Janney couplers, Graham draft rigging, pressed steel journal box lids and 33-in. cast iron wheels.

The Laconia Car Co. is building 50 cars for the Boston Elevated.

The Columbia Railroad of Washington, D. C., is in the market for 38 closed cable cars.

The Eckington & Soldiers' Home Railroad, Washington, D. C., is in the market for 75 closed cars.

BRIDGE BUILDING.

BELLOWS FALLS, VT.—The Bellows Falls & Saxons River St. Ry. Co. will build several steel bridges. (See Electric Railroad Construction column.)

CINCINNATI, O.—The Commissioners of Hamilton County will receive bids until Oct. 22 for building a wrought iron truss bridge over the canal in Sycamore township. Eugene L. Lewis, County Auditor.

DOBSON, N. C.—The authorities of Surry County, at their next meeting, will make arrangements for building an iron bridge across Fish River, between Dobson and Mt. Airy, to take the place of the one destroyed by the recent heavy rains.

EUTAW, ALA.—The Alabama Great Southern has let contracts for heavier steel bridges over the Black Warrior and Tombigbee rivers, near Eutaw, on the line between Meridian and Birmingham. The total cost of the two bridges is $35,000.

LEWISTON, IDA.—The Lewiston Water & Power Co. writes regarding the bridge to be built over Snake River from Lewiston, Ida., to Concord, Wash., that it will be built by the Lewiston-Concord Bridge Co., which is subsidiary to the Water & Power Co., which guarantees the bridge bonds. The structure will be a steel cantilever, about 1,685 ft. long. All the preliminary work is now finished, and Mr. E. H. Libby, President and General Manager of the Lewiston Water & Power Co., is now in Boston attending to the settlement of contracts. The Trustees of the companies are chiefly Boston men. It is hoped to begin work in from 30 to 60 days. In an earlier account we erroneously gave it as Lewiston, Wash., instead of Idaho.

LIVINGSTON MANOR, N. Y.—It is stated that a special election will be held to vote on the question of issuing bridge and road bonds.

OXFORD, MISS.—The Gulf & Chicago will require two bridges on its proposed extension. (See Railroad Construction Column.) (Sept. 30, p. 715.)

PARKER, S. D.—Reports state that bids are asked until Oct. 11 by the Commissioners of Turner County for building four steel bridges.

SALEM, ORE.—In the matter of the petition of U. S. Berry and others, for a bridge over North Fork of Santiam River, Marion and Linn County Courts met and agreed to receive bids for building the bridge. It must be completed by Dec. 1.

SIBLEY, IA.—The Burlington, Cedar Rapids & Northern is building a steel bridge across the Otter Creek, one mile west of Sibley. It will be 127 ft. long.

SOMERVILLE, N. J.—The town of Somerville, Somerset County, has given the Berlin Iron Bridge Co., East Berlin, Conn., the contract for an iron bridge. The span is about 60 ft., and the bridge has a clear roadway of 14 ft. The trusses will be of substantial latticed type. The floor will have steel beams and joists.

WESTBORO, MASS.—A bridge will be built over the Boston & Albany tracks at Water St., to cost $4-000.

WILKESBORO, N. C.—Reports state that the Commissioners of Wilkes County will be compelled to arrange for rebuilding and repairing a number of bridges recently damaged by floods.

WOODLAND, CAL.—The Supervisors of Yolo and Solano counties are negotiating with the Southern Pacific Co. in regard to building a bridge at Woodland. The county boards are to each pay one-third of the cost. The railroad proposed a wooden structure, but the Board of Supervisors of Yolo want a steel bridge.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Atlantic & North Carolina.—One per cent.
Berkshire.—Quarterly, 1½ per cent., payable Oct. 1.
Boston & Providence.—Quarterly, guaranteed, 2½ per cent., payable Oct. 1.
Central of New Jersey.—One per cent., payable Nov. 1.
Concord & Montreal.—Quarterly, 1¾ per cent., payable Oct. 1.
Delaware, Lackawanna & Western.—Quarterly, 1¾ per cent., payable Oct. 20.
Georgia RR. & Banking.—Quarterly, 2¾ per cent., payable Oct. 15.
Maine Central.—Quarterly, 1½ per cent., payable Oct. 1.
New London Northern.—Quarterly, 2¼ per cent., payable Oct. 3.
Northern of New Hampshire.—Quarterly, 1½ per cent., payable Oct. 1.
Norwich & Worcester.—Quarterly, 2 per cent., payable Oct. 1.
Seaboard & Roanoke.—Two and one-half per cent., payable Nov. 1.
Southwest Pennsylvania.—Five per cent., payable Oct. 1.
Vermont & Massachusetts.—Three per cent., payable Oct. 7.
Western Pennsylvania.—Three per cent., payable Oct. 15.

Boston & Chelsea St.—Three per cent., payable Oct. 1.
Brockton (Mass.) St.—Quarterly, 1½ per cent., payable Oct. 1.
Louisville (Ky.) Ry.—Preferred, 2½ per cent.
Lowell, Lawrence & Haverhill.—Quarterly, 1 per cent.
Newton (Mass.) St.—Quarterly, 2½ per cent., payable Oct. 1.
Twin City Rapid Tr.—Quarterly, preferred, 1¾ per cent., payable Oct. 1.

Society of Naval Architects and Marine Engineers

The sixth general meeting of the Society of Naval Architects and Marine Engineers will take place in New York City at 10 a. m., Thursday, Nov. 9, 1898. The meetings will be held in the auditorium at No. 12 West Thirty-first street, the sessions continuing through Thursday and Friday, Nov. 9 and 10. The programme showing the list of papers to be read at the meeting will be ready about Oct. 15.

Engineers' Club of Cincinnati.

At the September meeting, Mr. W. Hildenbrand, who has had charge of the remodeling of the suspension bridge at Cincinnati, which is now about completed, read a very interesting paper describing the work, the principal features of which consisted in the putting in of two additional cables, the entire reconstruction of the trusses and floor, the widening of the roadway and foot walks, the lengthening of the approaches, and improvement in the grades, all of which was accomplished without interfering with or interruption to the heavy travel of electric cars, vehicles and pedestrians during the period of rebuilding. (See the Railroad Gazette, Sept. 17, 1897, p. 645; May 20, 1898, p. 363.)

Chicago Electrical Association.

The Chicago Electrical Association has issued the advance programme of its meetings to Jan. 20 next, which will be held in Rooms 1736-1741 Monadnock Block, Chicago. The following is a list of the subjects of papers so far arranged for:

Oct. 7—"Electrical Features of the Spanish-American War," by Mr. Thomas G. Grier, Western Electric Co.
Oct. 21—"Practical Points on Electrical Measurement," by Mr. W. B. Hale, Cable Testing Department, Western Electric Co.
Nov. 4—"The Electrical Equipment of a Model Printing Establishment," by Mr. George A. Damon, Electrical Engineer, with Mr. B. J. Arnold, Chicago.
Nov. 18—"The Development of the Motor-Cycle," by Mr. F. B. Rae, Electrical Engineer, Chicago.
Dec. 2—"Practical Points in Street Railway Engineering," by Mr. W. A. Harding, Master Mechanic and Electrician, Calumet Electric Street Ry., Chicago.
Dec. 16—"Wireless Telegraphy," by Mr. Arthur V. Abbott, Chief Engineer, Chicago Telephone Co.
Jan. 6—"Telephone Engineering," by Mr. S. G. McMeen, Chief Engineer, Central Union Telephone Co.
Jan. 20—"Observations on Ventilating Fans," by Mr. Gerard Swope, Western Electric Co.

Western Society of Engineers.

A regular meeting of the Society was held at its hall, Monadnock Block, Chicago, on Wednesday evening, Oct. 5, when a paper on "The Track Elevation of the Chicago & Northwestern Ry." was presented by Mr. Louis H. Evans, Engineer of Track Elevation of the road and a member of the Society. In the discussion of the paper notes were presented on the track elevation of the following roads:

Illinois Central, by H. W. Parkhurst.
Chicago, Milwaukee & St. Paul, by Messrs. Webb, Rogers and Reichmann.
Chicago, Burlington & Quincy, by G. H. Bremner.
Lake Shore & Michigan Southern, Chicago, Rock Island & Pacific, by L. H. Clarke.
Pittsburgh, Fort Wayne & Chicago, by W. H. Coverdale.
Pittsburgh, Cincinnati, Chicago & St. Louis, by Thos. H. Johnson.
Sixteenth St. Crossing, by G. W. Vaughn.

Over 50 lantern slides, illustrating interesting features of the track elevation of the roads above mentioned, were shown, having been made from drawings and photographs especially for this meeting, which railroad officials and others interested were invited to attend.

Announcement has been made by circular that a special train would be provided, through the courtesy of the "Fort Wayne Route," to the members of the Society for an inspection trip over all the track elevation work at Chicago, on Saturday, Oct. 8.

The Railroad Young Men's Christian Association.

The ninth international conference of the Railroad Department of the Young Men's Christian Association will be held at Fort Wayne, Ind., Oct. 20 to 23. In addition to the condensed programme, given in a previous issue, the following has been arranged: J. H. Canfield, LL. D., President Ohio State University, will deliver the opening address Thursday evening. Friday evening will be taken up with addresses by railroad officials. W. H. Canniff, President New York, Chicago & St. Louis, and Joseph Ramsey, Jr., Vice-President and General Manager of the Wabash, are among the speakers. On Saturday evening Rev. P. S. Henson, D. D., of Chicago, will speak on "Misplaced Switches." Messrs. R. Nixon, of London, and Thomas Ridley, of Edinburgh, will represent the railroad men of England at this conference and will speak on the topic "Christian Work Among Railroad Men in Great Britain." The following are among other topics which will be discussed at the conference: "The Relation of the Railroad Department to the Spiritual Life of Railroad Men," by A. M. Waitt (L. S. & M. S.); "Thorough Organization Essential to Success," by W. J. Latta (Pennsylvania); "True Place of the Social Work in a Railroad Department," by W. E. Fenno, New Haven, Conn.; "Necessity and Value of Business Methods and Management in the Railroad Department," by R. Quayle (C. & N. W.); "Our Opportunity in the Educational Department," by George B. Hodge, International Secretary; "Need of Symmetrical Development," by speakers to be announced later. Free transportation has been granted for the delegates to this conference, and the Pullman and Wagner companies have arranged for a special rate of one fare for the round trip. Full information may be obtained from the Railroad Department of the International Committee at 3 West Twenty-ninth St., New York City.

American Society of Civil Engineers.

The September number of the Proceedings of the American Society of Civil Engineers contains a report in full of the Detroit meeting of the Society. At the meeting held Wednesday of this week Mr. T. A. Noble presented a paper on "Gaging of Cedar River, Washington." The author was engaged by the Seattle Power Co. to make the necessary plans and surveys for the installation of the water power plant on Cedar River for the purpose of transmitting power to Seattle and Tacoma, as previously described in the Railroad Gazette. This paper gives in detail the results of the experiments to determine the discharge of the river. The velocity of flow is shown by diagrams, and tables are appended giving the flow for different periods. We find in the regular flow of the river a variation of over 2,000 cu. ft. per second in the discharge of the river. The author calls attention to the necessity of determining by actual measurement the fluctuation of discharge, covering a sufficient period of time to develop any unusual condition which is liable to occur, and believes that no record of the discharges of a stream is of much value unless it covers a series of years. At this meeting Mr. E. J. Chibas, Assoc. M. Am. Soc. C. E., lately an engineer officer in the Fifth Army Corps, described informally the engineering work during the campaign at Santiago.

At the meeting to be held Oct. 19 Mr. Arthur L. Adams will consider the subject "Stave Pipe: Its Economic Design and the Economy of Its Use." This paper gives a very complete analysis of the subject, and the conclusions of the author are of considerable importance. He believes that the stave pipe stands unquestionably first as regards initial cost and carrying capacity when compared with cast iron and steel riveted pipes. Furthermore, he concludes that it is second only to cast iron in length of life.

PERSONAL

—Mr. Gustave R. Tuska, Chief Engineer of the Panama Railroad Company, has also been appointed Consulting Engineer to the American Representative of the Russian Government in connection with the Chinese Railroad system.

—Mr. William Bird, Assistant to the Treasurer of the Union Pacific, died in New York on Friday evening last of typhoid fever. Mr. Bird had been connected with the Union Pacific RR. for many years as Assistant Treasurer, being formerly in the Boston office.

—Mr. Wm. Kingsford, a Canadian civil engineer, died recently in Ottawa, Ont., at the age of 79. He was connected with the building of the Lachine Canal, the Hudson River RR., and the Victoria Bridge across the St. Lawrence. Mr. Kingsford was also a historian, having written the "History of Canada up to the Union of the Upper and Lower Provinces in 1841."

—Mr. George E. Gifford, M. Am. Soc. C. E., who has been the Eastern representative of the King Bridge Co. at Cleveland, O., has resigned. On Oct. 1 he assumed the position of Treasurer of the R. H. Hood Co., general contractors, at 220 Broadway, New York. Mr. Gifford has been connected with the King Bridge Co. for more than 10 years, and has been four years in their New York office.

—Mr. H. H. Rousseau, of the class of 1891 of the Rensselaer Polytechnic Institute, Principal Assistant Engineer of the Pittsburgh Bridge Company, stood first among the candidates in the recent examination held in Washington for Civil Engineers in the United States Navy. About 50 men started, and 18 finished the examination, all of those who finished being graduates of engineering schools. Last year, at a similar examination, two other graduates of the Rensselaer Polytechnic Institute, Messrs. Chambers and Parks, stood at the head of the list. Another graduate of this school, Mr. Arnold Sutermeister, of the class of 1892, recently passed first among the candidates for the position of Superintendent of Grade Crossings under the Railroad Commission of New York state, and was appointed to that position. About two years ago, when examinations were held for three different grades of engineering positions on the state canals, graduates of the Rensselaer Polytechnic Institute stood first in the lists for each of the three grades. Over 200 men took the examinations.

ELECTIONS AND APPOINTMENTS.

Alabama Great Southern.—The Car Accountant Departments of the Southern and A. G. S. have been separated. Hereafter all car reports will be sent to Chas. A. Wickersham, Superintendent of the A. G. S., Birmingham, Ala.

Baltimore & Ohio.—J. L. Crider has been appointed Supervisor at Wilmington, Del. He succeeds Joseph Wilkins, promoted. (Sept. 30, p. 713.) Geo. H. Campbell, Terminal Agent at Baltimore, has, in addition to his present duties, been appointed Inspector of Stations and Terminals over the whole line, reporting to the General Superintendents in their respective territories.

California Northwestern.—The San Francisco & North Pacific has been leased by the C. N. W., and will be operated under its management. H. C. Whiting has been appointed General Manager at San Francisco. F. K. Zook, heretofore Assistant Superintendent of the San Francisco & North Pacific, has been appointed Superintendent and Chief Engineer, with office at Tiburon, Cal. R. X. Ryan has been appointed General Passenger and Freight Agent at San Francisco. Thos. Mellerish has been appointed Secretary and Comptroller, San Francisco. Geo. C. Hickox has been appointed Cashier at San Francisco. John Bonner has been appointed Master Mechanic at Tiburon. Geo. H. McMullin has been appointed Train Dispatcher at Tiburon. C. M. Anderson has been appointed Storekeeper at Tiburon.

Central of Georgia.—S. E. Cowin has been appointed Soliciting Freight Agent, with headquarters at Birmingham, Ala.

Chattanooga Southern.—M. F. Bonzano, heretofore Superintendent of the Columbus, Sandusky & Hocking, has been appointed to his former position of General Manager of the C. S., with headquarters at Chattanooga, Tenn., succeeding W. S. Hoskins.

Chicago & Alton.—James A. Wilson, for 12 years General Agent in Texas, with headquarters at Fort Worth, has been appointed General Live Stock Agent, succeeding the late John Nesbitt. Mr. Wilson's headquarters will be in St. Louis.

Chicago & Eastern Illinois.—W. I. Cooke has been appointed Superintendent of Locomotive Service, with headquarters at Danville, Ill., in place of H. A. Dewey, resigned.

Chicago & Northwestern.—H. T. Bentley, Foreman of the shops at Belle Plain, Ia., has been appointed General Foreman of the Clinton shops.

Chicago & West Michigan.—F. M. Griggs has been appointed Commercial Agent of this road and the Detroit, Grand Rapids & Western, with headquarters at Grand Rapids, Mich. Thomas McGuire, heretofore Traveling Freight Agent at Grand Rapids, has been appointed Commercial Agent at Pittsburgh, Pa., a newly created position. E. J. Crossman has been appointed Traveling Freight Agent at Grand Rapids, Mich.

Chicago, Burlington & Quincy.—Geo. B. Dunbar, heretofore Assistant Auditor at St. Joseph, Mo., has been appointed Third Assistant General Auditor of the Burlington System, with headquarters in Chicago.

Chicago, Milwaukee & St. Paul.—The report that Geo. H. Foote, District Passenger Agent, has been appointed General Southern Agent at Kansas City, is denied by Mr. Foote. The report that Carl K. Landis had been appointed to the position vacated by Mr. Foote is necessarily incorrect.

Chicago, Rock Island & Pacific.—N. E. Casto, Contracting Freight Agent at Kansas City, has resigned to become Chief Clerk in the office of the Commercial Agent at that point. He is succeeded by T. O. Jennings. (Sept. 30, p. 713.)

Choctaw, Oklahoma & Gulf.—John H. Harris has been appointed Superintendent, with headquarters at South McAlester, Ind. Ter. This is a new office.

Cleveland, Cincinnati, Chicago & St. Louis.—T. S. Bunn has been appointed Trainmaster of the Peoria & Eastern Division, succeeding A. J. Connolly, deceased, with headquarters at Indianapolis, Ind.

Columbus, Lima & Milwaukee.—The officers of this company, referred to in the Construction Column, are: President, C. Cowles; Vice-President, H. R. Reynolds; Secretary and Treasurer, I. H. Reynolds; Chief Engineer, C. T. Hobart, New York City.

Crystal River.—The officers of this company, referred to in the Construction column, are: President, J. C. Osgood; Secretary and General Attorney, D. C. Beaman; Vice-President and General Manager, J. A. Kebler. The company's office is at 703 Boston Building, Denver, Col. (Aug. 26, p. 618.)

Deckerville, Osceola & Northern.—The officers of this company referred to in the Construction column are: President, Geo. W. Decker, Newport, Ark.; Vice-President and General Manager, E. M. Ford, Deckerville; Secretary and Treasurer, J. G. Webb, Deckerville; Chief Engineer, Major B. B. Gordon, Deckerville; Master Mechanic, Wm. Birch.

Detroit, Toledo & Milwaukee.—Daniel W. Morris has been appointed Cashier, with headquarters at Toledo, O.

Duluth, South Shore & Atlantic.—A. F. Agnew has been appointed Roundhouse Foreman at Marquette, Mich., in place of G. A. Gallagher.

Eastern of Minnesota (Great Northern).—The position of Trainmaster, lately held by George T. Ross, promoted, has been abolished. (Sept. 23, p. 695.)

El Paso & Northeastern.—E. Laville has been appointed Terminal Superintendent at El Paso, in charge of the track department, yards and sections centering at El Paso, Tex.

Erie & Huron.—H. B. Stuart has been appointed General Agent, with headquarters at Sarnia, Ont.

Grand Trunk.—F. C. Kinny having resigned, the office of Trainmaster at Sarnia is abolished. A. S. Begg has been appointed Superintendent of the St. Clair Tunnel and Terminals, embracing Port Huron

Tunnel and city, and the Ft. Gratiot yards in Michigan; also the Sarnia Tunnel and city, and Port Edward yards, Ont. Mr. Begg will also assume the duties of Agent at Port Huron Tunnel, heretofore performed by Mr. Kenny. His headquarters will be at Port Huron Tunnel Station. C. H. Bevington has been appointed Chief Train Dispatcher of the Twenty-seventh, Twenty-eighth and Twenty-ninth Districts, and a portion of the Twenty-fifth District, succeeding V. A. Cooper, resigned, with headquarters at Detroit, Mich.

A. E. Rosevear, heretofore Accountant of the Reading Dispatch at Detroit, Mich., has been appointed Freight Claim Agent, succeeding C. J. Haigh, with headquarters in Montreal.

J. Piper, Roadmaster, with headquarters at Toronto, has been transferred to Brantford, Ont., with jurisdiction over the Brantford & Tilsonburg branch, and the Harrisburg & Guelph Division. He succeeds P. Earle, who has been acting in that capacity. Chas. O'Dell has been appointed Roadmaster of the 16th District and Toronto Terminals, vice J. Piper, transferred.

John P, Faurot has been appointed Traveling Agent of the Grand Trunk Dispatch Fast Freight Line, with headquarters at Detroit, Mich.

Great Northern.—Cameron B. Dean, heretofore Traveling Passenger and Immigration Agent at Philadelphia, has been appointed General Agent at Detroit, Mich., succeeding E. B. Clark. (Sept. 23, p. 696.)

Gulf, Colorado & Santa Fe.—W. W. Pope, Auditor at Galveston, Tex., has resigned.

Hoosac Tunnel Line.—D. F. Jennings, heretofore Assistant General Freight Agent of the Toledo, St. Louis & Kansas City, has been appointed General Manager, with headquarters in Chicago.

Houston & Texas Central.—Geo. Kidd, Jr., has been appointed Chief Clerk to J. T. Mahl, Engineer Maintenance of Way, with office at Houston, Tex. He succeeds John R. Behrman.

Illinois Central.—At the annual meeting of the stockholders, held in Chicago Sept. 28, Morton Grinnell was elected a Director to succeed Col. S. V. R. Cruger, deceased.

T. W. Sloan has been appointed Foreman of Car Department at the New Orleans Terminals. He succeeds B. S. McClellan, promoted. (Sept. 16, p. 678.)

Intercolonial.—G. R. Joughins has been appointed Mechanical Superintendent, with headquarters at Moncton, N. B. Mr. Joughins was heretofore Superintendent of Motive Power on the Norfolk & Southern, with headquarters at Berkeley, Va. G. H. Pick, formerly Assistant General Freight Agent, has been appointed Weighing Inspector, with headquarters at Moncton, N. B.

International & Great Northern.—J. D. Trammell has been appointed Chief Engineer, with headquarters at Palestine, Tex.

Kanawha & Michigan.—W. G. Christmas, heretofore Chief Clerk for Superintendent J. W. Dawson, has been appointed Superintendent, with headquarters at Charleston, W. Va., succeeding Mr. Dawson, resigned. (Sept. 30, p. 714.)

Kansas City, Pittsburgh & Gulf.—F. W. Pulliam has been appointed Private Secretary to W. E. Green, Superintendent of the Southern Division, with headquarters at Texarkana, Tex.

Lehigh Valley.—Harry Wilbur has been appointed Division Engineer, with office at Easton, Pa. The office of Roadmaster in the Lehigh and Eastern & Amboy Divisions has been abolished. The following who were heretofore Roadmasters have been appointed Supervisors: Edward J. Dorsey, Easton & Amboy, with headquarters at Easton, Pa.; John Redington, Lehigh Division, with headquarters at Easton, Pa.; John Dinan, heretofore an Assistant Roadmaster, Pottsville Branch, with headquarters at Lizard Creek Junction, Pa.

Louisville & Nashville.—Elliott Lang, Divison Freight Agent at Memphis, Tenn., has resigned. He is succeeded by John Fitzgerald, who has been General Agent at Chicago. J. P. Bowling, Traveling Freight Agent, with headquarters at Pittsburgh, has been made General Agent at Chicago, succeeding Mr. Fitzgerald. H. Jay Mead, Traveling Freight Agent at New York, has been appointed Traveling Freight Agent at Pittsburgh to succeed Mr. Bowling.

Manitoba & Northwestern.—Owing to the change in the ownership of this road, Andrew Allen, President, Montreal, Que., and Montague Allen, Vice-President, have resigned. The President is now E. B. Osler of Toronto, Ont., and Vice-President, Wm. Hendrie of Hamilton, Ont.

Manitoba & Southeastern.—This line, now under construction from Winnipeg southeasterly, will be operated by the staff of the Lake Manitoba Railway & Canal Co., which is owned by McKenzie, Mann & Co. The main offices are in Winnipeg, Manitoba.

Mexican National.—J. E. Cates, heretofore Traveling Freight and Passenger Agent at 353 Broadway, New York, has been appointed Contracting Freight Agent, with office at same point. He is succeeded by H. J. Falkenbach. (Sept. 23, p. 696.)

Michigan Central.—The office of Canadian Passenger Agent, lately held by John G. Laven at Toronto, will be abolished. (Sept. 23, p. 696.) The territory east of the Detroit River, with the exception of the lines of the M. C. west of and including Welland, Ont., has been added to the jurisdiction of W. H. Underwood, General Eastern Passenger Agent at Buffalo, N. Y. The Ticket Agents in Canada west of and including Welland, are placed under the supervision of S. H. Palmer, City Passenger and Ticket Agent at St. Thomas, Ont. The territory lately covered by L. L. Caufy, Wisconsin Passenger Agent at Milwaukee, has been added to that of W. L. Wyand, Northwestern Passenger Agent at St. Paul, Minn. (Sept. 23, p. 696.) Alfred P. Blosier has been appointed City Passenger and Ticket Agent at Buffalo, succeeding W. H. Leslie.

F. M. Griggs, General Agent at Grand Rapids, Mich., has resigned.

Minneapolis, St. Paul & Sault Ste. Marie.—Chas. Litzky, Chief Clerk to F. S. Underwood, General Manager, has resigned.

Missouri Pacific.—A. V. Brigham has been appointed Traveling Passenger Agent for Arkansas, with headquarters at St. Louis.

Nashville, Chattanooga & St. Louis.—Geo. McLaren, heretofore in the Rate Department of the Cincinnati, New Orleans & Texas, has been appointed Soliciting Agent of the N., C. & St. L., with headquarters at Cincinnati. A. J. Welch, Soliciting Freight Agent at Memphis, Tenn., has been appointed Division Passenger Agent for the Memphis & Paducah Division, with headquarters at Memphis. T. G. McClellan, heretofore Commercial Agent of the Southern at Memphis, has been appointed Division Freight Agent of the N., C. & St. L. at the same point.

New York Central & Hudson River.—Samuel E. Williamson has been appointed General Counsel of the N. Y. C. & H. R., and its affiliated lines east of Buffalo. He succeeds the late ex-Judge Ashbel Green. Mr. Williamson has been heretofore the General Counsel of the New York, Chicago & St. Louis, with headquarters at Cleveland, O. His future headquarters will be in New York.

New York, Susquehanna & Western (Erie).—R. M. Parker has been appointed Assistant General Freight Agent at New York. Henry Adams, who has been acting Assistant General Freight Agent, resumes his duties as Division Freight Agent in charge of freight traffic on the New York and Delaware divisions and the Northern of New Jersey. His headquarters are in New York.

Norfolk & Western.—J. A. Lawrence, who has been Foreman of the Columbus, O., shops, has resigned. He is succeeded by Geo. Burdell.

Northern Pacific.—Alfred Lovell, heretofore Engineer of Tests, has been appointed Assistant Superintendent of Motive Power, with office at St. Paul.

At a meeting of the stockholders held in New York Oct. 5, Geo. F. Baker was elected a Director, succeeding Francis L. Stetson.

Ohio Central.—M. D. Jones, Train Dispatcher, has resigned. M. M. Hinchey has been appointed to the vacant position and F. D. Poland, heretofore Train Dispatcher at Bucyrus, O., succeeds Mr. Hinchey. J. S. Power, Trainmaster at Bucyrus, has been appointed Train Dispatcher and his former office abolished.

Reading Dispatch.—C. J. Haigh, heretofore Freight Claim Agent of the Grand Trunk at Montreal, Que., has been appointed Manager of R. D. fast freight line, with headquarters at Detroit, Mich. He succeeds James McQueen, deceased. (See Grand Trunk.)

St. Louis Southwestern.—S. G. Warner has had his title changed to that of General Passenger and Ticket Agent of the Texas Road, with headquarters at Tyler, Tex. This act completes the separation of the St. Louis Southwestern and the St. Louis Southwestern of Texas.

Southern.—Samuel C. Nefler, Commercial Agent at Cincinnati, O., has been appointed Commercial Agent at Chicago in place of Henry Hiden. J. J. Webster, Traveling Freight Agent at St. Louis, has been appointed Commercial Agent at Cincinnati, succeeding Mr. Nefler. W. N. Foreacre has been appointed Trainmaster at Atlanta, Ga., succeeding S. B. Bennett, resigned. The appointment took effect Oct. 1.

T. L. McClung has been appointed Commercial Agent at Nashville, Tenn.

Toledo & Ohio Central.—J. S. Powers, Trainmaster of the Eastern Division, with headquarters at Bucyrus, O., has been appointed Train Dispatcher. The office of Trainmaster is abolished.

Union Pacific.—Howard Bruner has been appointed Chief Tariff Clerk in the General Freight Department at Omaha, Neb., succeeding C. M. Secrist. (Sept. 30, p. 714.)

Vanderbilt Fast Freight Lines.—A circular issued by Nathan Guilford for the New York Central & Hudson River, P. R. Todd for the West Shore, G. J. Grammer for the Lake Shore & Michigan Southern, B. B. Mitchell for the Michigan Central, and E. F. Cost for the Cleveland, Cincinnati, Chicago & St. Louis, makes the following announcements: The Red, White, Blue, Canada Southern and Midland fast freight lines will be consolidated, with F. L. Pomeroy as General Manager. The West Shore, Nickel Plate and North Shore Dispatch fast freight lines will be consolidated, with W. F. Wilson as General Manager. Geo. G. Street has been appointed General Accountant of the consolidated lines. The offices of Messrs. Pomeroy, Wilson and Street are at 736 Mooney & Brisbane Building, Buffalo, N. Y. A joint circular issued by Mr. F. L. Pomeroy and Mr. W. F. Wilson, announces the following appointments, effective Oct. 1:

I.—South Shore Lines, via Lake Shore & Michigan Southern and connections:

Cincinnati.—W. S. Morrill, Agent, W. H. Applegate, Traveling Agent, M. J. Todd, Contracting Agent, White, West Shore and Nickel Plate lines.

Cleveland.—S. C. Lovis, Agent, S. A. Lytle, Contracting Agent, Red, White and West Shore lines.

Columbus.—G. T. Chamberlain, Agent, J. E. Kane, Contracting Agent, White, West Shore and Nickel Plate lines.

Dayton.—G. W. Kendrick, Agent for the White, Nickel Plate and West Shore.

Des Moines.—J. B. Collins, Agent for the Red, White, West Shore and Midland lines.

Evansville.—S. D. McLeish, General Agent for the White, West Shore and Nickel Plate lines.

Indianapolis.—L. J. Blaker, Agent, J. A. Simmons, Traveling Agent, F. R. Sullivan, Contracting Agent, White, West Shore and Nickel Plate lines, and L. L. Fellows, Agent for the Midland lines.

Kansas City.—L. A. Etter, Agent for the Red, White, Midland and West Shore lines.

Louisville.—B. H. Dudley, Agent, H. R. Frost, Jr., Contracting Agent for the White, West Shore and Nickel Plate lines.

Memphis.—W. M. Pennington, General Southern Agent, J. E. Van Trees, Contracting Agent for the White, West Shore and Nickel Plate lines.

Milwaukee.—R. J. Nicond, Agent, A. E. Shultz, Traveling Agent for the Red and West Shore lines.

Minneapolis.—J. G. Hamilton, Northwestern Agent, T. A. Matthews, Traveling Agent, W. T. Blew, Contracting Agent for the Red, West Shore and Nickel Plate lines.

Omaha.—D. F. Hurd, Agent for the Red and West Shore lines.

Peoria.—L. L. Thurber, Agent, Red, White, West Shore and Nickel Plate lines, and G. I. Brown, Agent for the Midland lines.

St. Louis.—Walter Nichols, Agent, E. L. Roederer, Contracting Agent, H. J. Burgee, Contracting Agent for the White, West Shore and Nickel Plate lines.

II.—North Shore Lines, via the Michigan Central and connections:

Cincinnati.—C. H. King, Agent, C. M. Cary, Contracting Agent for the Blue, Canada Southern and North Shore Dispatch.

Detroit.—C. C. Griggs, State Agent, W. C. Lewis, Traveling Agent, A. T. Sullivan, Contracting Agent, W. J. Gordon, Contracting Agent, E. T. Flannigan, Contracting Agent for the Blue, Canada Southern and North Shore Dispatch.

Indianapolis.—O. R. Johnson, Agent, North Shore Dispatch, and F. H. Ensworth, Agent for the Canada Southern.

Kansas City.—I. G. Mitchell, Agent, R. J. Wells, Contracting Agent, J. S. York, Contracting Agent, with office at Omaha, for the Blue, Canada Southern and North Shore Dispatch lines.

Louisville.—C. R. Watson, Agent, C. M. Elliott, Contracting Agent for the Blue line; C. H. King, Agent, A. T. Almond, Contracting Agent for the Canada Southern and North Shore Dispatch lines.

Memphis.—S. J. York, Southern Agent, M. W. Waynesburg, Contracting Agent for the Blue, Canada Southern and North Shore Dispatch lines.

Milwaukee.—F. W. Ten Winkel, Agent, C. A. Brown, Traveling Agent for the Blue, Canada Southern and North Shore Dispatch lines.

Minneapolis.—F. S. Swisher, Agent, H. Morse, Traveling Agent, for the Blue, Canada Southern and North Shore Dispatch lines.

St. Louis.—E. B. Smith, Agent for the Blue Line, and B. H. Coyle, Agent for the Canada Southern.

It appears from the addresses given in the official circular that in cities where there are two or more agencies there are as many offices as there are agents; no two agents located in the same city have the same street addresses.

Washington & Columbia River.—E. Ringer has been appointed Chief Train Dispatcher, with office at Hunt's Junction, Wash.

Western Maryland.—On behalf of the city of Baltimore, Mayor Malster appointed on Sept. 24 three new Directors: Henry F. Turner succeeds Lloyd L. Jackson; J. M. Littig succeeds L. Weinberger, and Simon P. Schoot succeeds J. C. Legg. H. E. Passmore has been appointed Master Mechanic, with headquarters at Hagerstown, Md. David Holtz has been heretofore Master Mechanic, with headquarters at Union Bridge. Mr. Passmore has been heretofore Foreman of the Philadelphia & Reading shops at Tamaqua.

West Virginia Central & Pittsburgh.—J. S. Turner, Superintendent of Motive Power, with headquarters at Elkins, W. Va., has resigned, to take effect Oct. 15.

Wheeling & Lake Erie.—J. B. Lownsbury, General Agent at Toledo, O., in addition to his present duties, will take charge of the traffic coal matters of the firm of M. A. Hanna & Co., who have contracted for the product of all the W. & L. E. coal mines. M. O. Guiss, Chief Clerk in the Auditing Department, has resigned.

White Pass & Yukon.—The officials of the Operating Department of this road are E. C. Hawkins, Chief Engineer; F. H. Whitney, Division Engineer; W. L. Wilson, Purchasing Agent; J. W. Young, General Storekeeper, and E. H. Birks, Freight and Passenger Agent. W. H. Garlock is Master Mechanic. (Aug. 26, p. 618.) The headquarters are at Skaguay, Alaska.

Wisconsin & Michigan.—A. H. Crocker, Superintendent, with headquarters at Peshtigo, Wis., has resigned and the office will be abolished. O. A. Koss, Auditor, with office in Chicago, has resigned, and the duties of the position will be assumed by A. A. McFall, heretofore General Agent at Menominee, Mich., who will also have supervision over operations. His headquarters will be at Peshtigo, Wis. A. N. Kinsman, Chief Engineer, will have charge of track, bridges and building.

RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

ALLEGHENY VALLEY.—Permission has been granted to this road to lay an additional track along Pike St., in Pittsburgh, Pa., double tracking its line along that thoroughfare.

ATLANTIC & LAKE SUPERIOR.—Officials of this company inform us that it has succeeded in floating its bonds in London (Sept. 9, p. 656), and that an agreement has been entered into with the Great Western of England. The plan includes a line of steamers, under the name of the Canadian Steamship Co., to be put on this fall between Paspebiac, Canada, and Milford Haven, Wales. The steamers are already engaged, it is asserted, and are to have a speed of 17 knots per hour. The Ottawa Government will be asked to include Milford Haven as one of the ports for the delivery of mail, and if this is granted, a tender will be made to the Department by the new line for carrying mails. The A. & L. S. has a charter enabling it to run a railroad from Montreal along the south shore of the St. Lawrence to Chaudière Junction, where it connects with the Intercolonial, over which it has trackage rights as far as Metapedia, and from that point its own Baie des Chaleurs line is utilized to Paspebiac. The Paspebiac harbor is said to afford an ample and safe anchorage and entirely free from ice in the winter. It is also by far the most eastern of any Canadian harbor. Of this railroad, the only portions that remain unfinished are some short sections between Sorel and Chaudière. The men who control the road also own the charter for the Montreal Bridge, the plans for which are completed. This bridge is to cross the St. Lawrence from the suburbs of Longueuil, Que., to the eastern end of Montreal, passing over the ship canal with a span of 100 ft., at an elevation of 150 ft.

BRUTON & PINEORA.—The annual report of the Central of Georgia states that during the year the entire stock of $250,000 of the Bruton & Pineora from Bruton, Ga., southeast 98 miles toward Pineora, of which a part is built, was bought for $310.127, to be paid in monthly installments of $8.000, with interest at 5 per cent. Included in the cost was an amount estimated to put the road in operation between Bruton and Stillmore, 38 miles, which sum was to be expended upon the property under the supervision and control of the C. of G. The road is now operated to Stillmore, and the work to the temporary terminus, 58 miles from Bruton, will be finished Nov. 1. It is intended to extend the line as soon as practicable to connect with the main line of the C. of G. at Pineora. (July 29, p. 555.)

BUFFALO, ROCHESTER & PITTSBURGH.—Rails are being laid at the rate of one-half mile a day on the eastern end of the Allegheny & Western extension from Punxsutawney, Pa., west 98 miles to New Castle. (Sept. 16, p. 678.)

CANTON, ABERDEEN & NASHVILLE.—The application made to the Secretary of State of Alabama in August for a charter was granted Sept. 26. The proposed route is from the Aberdeen Branch of the Illinois Central at West Point, Miss., to run northeast 58 miles to Winfield, Ala., and thence nine miles to the Clifty coal basin. It is understood that work is to begin at once on this latter section. (Sept. 16, p. 678.)

CARSON & COLORADO.—An extension is reported under consideration from the southern terminus of this line at Keeler, Cal., south about 100 miles to Mojave on the Santa Fe Pacific. The line now runs north 93 miles into Nevada.

CENTRAL OF GEORGIA.—The necessary permission to build a track from the present terminal in Savannah, Ga., on River street, to the Tybee Depot, has not yet been obtained. Negotiations are in progress for the building of spur tracks to industries along the line, and the rights of way are being obtained. (Official.)

CHATTAHOOCHE VALLEY. — The President writes that the proposed extension from Riverview, Ga., southwest to Columbus will not be built by the company. Atkinson & Turner have made surveys, however, and will probably build the line. (June 24, p. 466.)

CHICAGO & GULF.—The line from Pontotoc, Miss., south via Houston to Starkville, is to be built by the C. & G. The charter is granted, but no surveys are made yet. The line will pass through a flat wooded country. It will require two bridges.

CHICAGO, INDIANA & EASTERN.—Grading was to begin Oct. 1, on the extension from Swayzee, Ind., to Converse, seven miles. H. E. Drew of Fairmount, Ind., is General Manager. (Aug. 26, p. 618.)

CHICAGO, MILWAUKEE & ST. PAUL.—Permission has been granted by St. Paul, Minn., for this road to construct a spur track across Second St. and a portion of the public levee and Jackson St., in that city.

CITY BELT.—This company is being organized in Iowa to build a four-track belt line, three miles long, down Cedar River at Cedar Rapids. It is stated that the Chicago & Northwestern, the Chicago, Milwaukee & St. Louis, the Illinois Central and the Burlington, Cedar Rapids & Northern are interested in the line.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—In reference to the raising of tracks and enlarging the embankments at Columbus, O., Geo. W. Kittredge, Chief Engineer, submitted a statement to the City Council stating that the road would agree to do the work for $29,150. The work contemplated covers the raising of the tracks and the enlarging of the embankment from the Scioto River to a point not far from the State Pumping Station at West Columbus. The City Council was in favor of adopting the proposition, and gave the ordinance its first and second reading.

CLEARFIELD SOUTHERN.—Patrick McGovern of Tyrone, Pa., the contractor, is reported to have begun grading on this line from Clearfield Bridge, Pa., on Beech Creek to Belsna Mills on the Pennsylvania, 15 miles. A. W. Lee of Clearfield is President, and Samuel Brugger of Fleming, Pa., Chief Engineer. (July 22, p. 538.)

COAST RAILWAY OF NOVA SCOTIA.—The extension to Barrington, N. S., 20 miles, is to be completed by Nov. 1. The line runs from Yarmouth east and south along the coast to East Pubnico, 31 miles, and it is proposed to extend the road to Halifax. (Sept. 9, p. 659.)

COLORADO & NORTHWESTERN.—A contract has been let to build a switch from the cut beyond Bloomersville, Col., to the Big Five mine, a distance of three-fourths of a mile.

COLUMBUS, LIMA & MILWAUKEE.—Contracts are reported let and grading is to begin at once on this line from the coal fields in Southern Ohio to Columbus, and thence north via Lima to Defiance. The officers are given under Elections and Appointments.

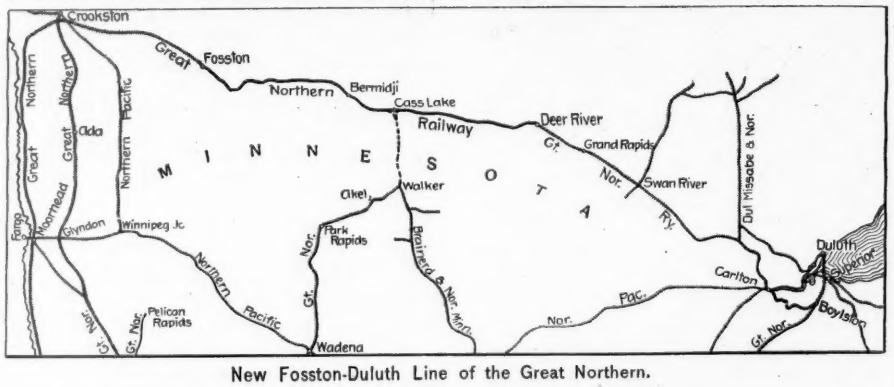
CRYSTAL RIVER.—It is stated that 28 miles of this road was graded in 1893, and track laid for 14 miles, but the line has never been in use. The company is now surfacing the completed 14 miles and laying track for three miles more on the old grade. The line as projected is to run from Carbondale, Col., on the Aspinook extension of the Denver & Rio Grande, up Crystal River toward the Yule Creek marble beds. The officers are given under Elections and Appointments.

DECKERVILLE, OSCEOLA & NORTHERN.—This company, incorporated last year to build the line from Deckerville, Ark., on the Kansas City, Fort Scott & Memphis, northeast 33 miles, to Osceola, and eventually to Paw Paw Junction on the St. Louis Southwestern, has now 12 miles of the road from Deckerville in use. The company expects to begin surveying for an additional 20 miles within the next 10 days, but is not prepared yet to let contracts. About 50 men are at work on the old section raising track and ballasting with sand. The work for the extension is very light. The maximum curves are 4°. (Nov. 12, 1897, p. 806.) The officers are given under Elections and Appointments. (Official.)

DULUTH & NORTHERN MINNESOTA.—Six miles of track is reported laid on this line from Knife River, Minn., into timber, and grading is completed for four miles more. Alger Smith & Co. of Detroit, are building the line, and Martin S. Smith of that company is President. (Aug. 26, p. 619.)

FLORIDA, ALABAMA & NORTHERN.—A letter from W. B. Wright of Pensacola, Fla., President of this company, states that work is to begin shortly on this proposed line from Elba, Coffee County, Ala., southwest 125 miles to Pensacola, Fla. (April 8, p. 265.)

GREAT NORTHERN.—The laying of the last rail on the section from Fosston, Minn., east 98.5 miles to Deer River, completes the last link in the new line between Crookston and Duluth. The portion of this line from Deer River to Namadji is the Duluth, Superior & Western. It was bought by the Eastern Railway of Minnesota, a leased line of the G. N., on June 22 last. The company has completed the connection from Namadji on the D. S. & W. to the main line at Colquet, 27.5 miles. By this route the distance from Duluth to Crookston is reduced to about 255 miles, which is less by about 134 miles than the old route by way of St. Cloud, and less by 45 miles than the shortest line of the Northern Pacific. The company is building an extension of the Park Rapids & Leech Lake branch to a point on the new line to be known as Cass Lake. This is a new station and is to be made, so it is reported, an important division terminal. The Park Rapids & Leech Lake branch was completed to Ackley last year. (Jan. 14, p. 34; Sept. 2, p. 639.)



New Fosston-Duluth Line of the Great Northern.

LONG ISLAND.—The Atlantic Avenue Railroad Commission and President Baldwin of the L. I., have decided that as soon as the New York State Legislature meets they will have an appeal presented for the franchise to build a tunnel under the East River and the land approaches, in accordance witht he plans already prepared. (Feb. 25, p. 224.)

LOUISVILLE & NASHVILE.—The freight yard at Mobile, Ala., is practically completed. It contains 17 tracks and has a capacity of about 1,500 cars.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—The extension of this line from Kulm, N. D., west toward Bismarck, is completed for 57 miles to a point beyond Napoleon, and trains are running to that city. (July 15, p. 522.)

MISCELLANEOUS COMPANIES.—The Potts Construction Co. of New York City has been incorporated in West Virginia, with a capital stock of $1,200, with the privilege of increasing to $1,000,000, to build railroads, buildings, streets, bridges, etc. Among the incorporators are Geo. Potts, Ocean Grove, N. J.; R. L. Smith, C. G. Funk, C. H. Phelps of New York City, and Loyal S. Nye of Binghamton, N. Y.

NEBRASKA & NORTHERN.—Grading is reported in progress on this line from Atkinson, Holt County, Neb., on the Fremont, Elkhorn & Missouri River, north about 25 miles to Perry, the new county seat. A ferry for temporary use across the Niobrara River is being built. The principal office is Omaha, Neb. (March 11, p. 188.)

NORFOLK & PORTSMOUTH BELT.—This belt line from Berkeley, Va., to Port Norfolk, 6.5 miles, is completed and is in full operation. It gives the lines coming in from the South better facilities at Norfolk and Portsmouth for the direct shipment of their goods North. The bridge across Elizabeth River is 1,500 ft. long. (July 8, p. 503.)

NORTHERN PACIFIC.—J. Davidson & Co. are reported to have received a contract to build a branch about 1.5 miles long to connect Ino, Wis., with timber.

OMAHA BRIDGE & TERMINAL.—An ordinance giving the right to lay track in the north part of the city of Omaha has been introduced at a special meeting of the City Council. It was read a first and second time and referred to a committee.

OREGON RAILROAD & NAVIGATION.—The filling in of the trestles and culverts on the Colfax Moscow Branch is about half completed. All the trestles between Pullman and Moscow, five miles, have been filled and the graders have nearly reached Guy, Wash., 15 miles. (Sept. 9, p. 656.)

PEMBROKE SOUTHERN.—Track is laid for the entire distance on this line from Pembroke, Ont., southwest 21 miles to Golden Lake. The line is projected through to Haliburton. Russell & Ponlin have the contract. (Aug. 19, p. 603.)

PENNSYLVANIA.—The petition to vacate a certain district of the Tenth Ward in Pittsburgh, on which the freight depot yards and the system of elevated tracks and bridges are to be built, has been recommended favorably to the City Council. The improvements which this road contemplates making will cost in the neighborhood of $1,000,000. Franchise was granted to H. K. Porter & Co. of Pittsburgh, to lay a switch track along Colton and Hemlock Sts., connecting their works with the tracks.

PLANT.—A switch is being built at Brunswick, Ga., about 200 ft. in length, to the docks, to accommodate the cotton traffic.

PITTSBURGH & EASTERN.—Several surveys have been made for this proposed extension of this line from Mahaffey, Pa., southwest about 115 miles to West Newton, and it is expected that grading is to begin soon. (Oct. 15, 1897; p. 737.)

PORTLAND & CAMDEN.—This company has been incorporated in Indiana, with a capital stock of $50,000, to build a line in Jay County, from Portland northwest 12 miles to Camden. The incorporators are G. A. Mason, Hugh Knapp, W. B. Cooley, D. E. Studebaker and W. J. Cooke.

RESTIGOUCHE & WESTERN.—Construction is being pushed on this line from near Campbellton, N. B., west about 106 miles to the St. John's River in New Brunswick, where connection will be made either with St. Leonards or Gand Falls. Grading is nearly finished on the first 20 miles from Campbellton. Malcolm & Ross of St. Leonards have the contract. (Sept. 9, p. 656.)

SAGINAW SOUTHERN.—This company was incorporated in Arizona Sept. 27, with a capital stock of $250,000, to build a line from Williams on the Santa Fe Pacific, south about 36 miles to Jerome. The incorporators are: John C. Brown, George C. Wharton, Max Salzman, William P. Cutting, Charles F. Roberts and Edward M. Dee.

ST. JOSEPH & GRAND ISLAND.—Grading is reported begun on the North RR., recently incorporated to form the cut-off from Gower, Mo., to Trimble, about 11 miles. The company expects to have the grading done before the end of October. (Sept. 16, p. 679.)

SANTA FE, PRESCOTT & PHOENIX.—The Prescott & Eastern extension from Phoenix, Ariz., south 26.5 miles to Mayers, is completed, and was to be opened for business Oct. 1. (Sept. 30, p. 715.)

SIOUX CITY, CHICAGO & BALTIMORE.—At a special meeting of the stockholders, recently held at Sioux City, Ia., it was decided to change the name to the St. Louis, Iowa & Dakota. The line is projected to run from Sioux City southeast 512 miles to St. Louis, Mo. (April 15, p. 285.)

SKANEATELES.—This road has secured permission from the village to extend its tracks across Railroad St. and across the lake to Genessee St., on the west side of the bridge. It is stated that the company proposes to build a terminal station there and extend the terminus to that point.

SOUTHERN.—The extension of the North Carolina Midland from Mocksville, N. C., northeast 27.4 miles to Mooresville, is completed, and trains began running last week. (June 24, p. 467.)

STOCKTON & TUOLUMNE.—Grading is completed for 17 miles from Stockton, Cal., on this line from Stockton east about 70 miles, via Copperopolis and Sonora, to Summerville in Tuolumne County. Surveys have been made as far as the Stanislaus River, 45 miles. The company will use 60-lb. rails for the first 25 or 30 miles across the San Joaquin Valley, and 65-lb. rails on the Northern Division. The first consignment of the 60-lb. rails from the Pennsylvania Steel Co., sufficient to lay 12 miles of track, is now at Stockton, and track laying will begin soon. (Aug. 19, p. 603.) Mrs. Annie Kline Rickert, Grand Hotel, San Francisco, Cal., is President. (Official.)

TORRES & PRIETAS.—This company is building 60 miles of line from Torres, Mexico, east through the state of Sonora to Santa Cruz. Of this 50 miles is graded and rails are laid for 20 miles. The company expects to have the road completed by Jan. 1. (July 15, p. 508.) J. H. Thomas of Torres is Superintendent and Chief Engineer. (Official.)

TUSCARORA VALLEY.—Grading is reported in progress on the extension of this line from Port Royal, Pa., southwest to McConnellsburg. (Aug. 19, p. 603.)

WASHINGTON COUNTY.—It is expected that this line from Ellsworth, Me., on the Maine Central east about 104 miles to Calais, with a branch from Pembroke to Eastport, will be completed about Nov. 1. The sections from Ellsworth to Cherryfield, from Calais and Eastport to Columbia, and the spur line to Eastport, 13 miles, have been tracked. A junction with the Grand Southern at St. Stephen is contemplated. (Sept. 2, p. 639.)

WELLINGTON & POWELLSVILLE.—Rails are reported laid for the whole distance from Windsor, N. C., north 21 miles to Ahoskie. (June 24, p. 467.)

WHITE PASS & YUKON.—This line is now open from Skaguay, Alaska, to the top of White Pass, 20 miles. E. B. Hussey, who has charge of the Seattle, Wash., headquarters, says that the service is giving satisfaction and that most of the freight accumulated at Skaguay has been sent forward. (Sept. 9, p. 656.)

WISCONSIN & MICHIGAN.—T. J. McGrath of Green Bay, Wis., has the contract for building the extension from Faithorn Junction, Mich., north 16 miles, via Vulcan and Norway to Quinnesee. Grading is finished for three miles. (Sept. 9, p. 657.)

Electric Railroad Construction.

BALTIMORE, MD.—The Edmondson Ave., Catonsville & Ellicott City Ry., now owned by the Maryland Traction Co., is nearly completed to Ellicott City.

The general contract to build the City & Suburban Ry. of the District of Columbia was awarded to E. Saxton of Washington. The contract for track material was given to Johnson & Co. of Pennsylvania. The City & Suburban is a part of what was formerly the Columbia & Maryland, or better known as the Boulevard line.

BARABOO, WIS.—Messrs. Cottrill, Grotophorst and Butler are interested in a project to build an electric railroad between Devil's Lake and Kilbourn. A franchise is asked for from the City Council of Baraboo.

BELLOWS FALLS, VT.—The Bellows Falls & Saxtons River St. Ry. Co. is organized to build an electric road. The officers are: J. H. Holton of Burlington, Vt., President; A. N. Swain, Vice-President; J. J. Flynn, Treasurer; George A. Weston of Bellows Falls, Secretary. Several steel bridges will be built. The company will do a passenger and freight business.

BOULDER, COL.—Reports state that the City

Council has given a franchise to a company to build an electric road in the city.

CHICAGO, ILL.—Work was begun Sept. 26 on the excavations for the last of the foundations for the Northwestern Elevated road. From Chicago Ave. to the terminus of the road north of Graceland cemetery four tracks will be laid, two for trains stopping at every station and two for express trains, which will stop once in every mile. Passengers will be able to transfer from slow to fast trains by crossing a platform connecting the two systems. It is stated that the express stations will be at Wilson Ave., Sheridan Road, Belmont, Fullerton and Chicago Aves. and Kinzie and Wells Sts.; also that construction will be pushed rapidly, so that the road will be finished and in operation next summer. Detailed information regarding the length of this road and the parts already completed was given in our issue of Jan. 21, page 40. (See also Sept. 23, p. 697.)

DETROIT, MICH.—The Trustees of Highland Park have given a franchise to the Detroit Citizens' St. Ry. and an extension will be made through the village to Six Mile Road.

EAU CLAIRE WIS.—In the Federal Court at Madison, Sept. 30, the petition of the Chippewa Valley Electric Ry. Co. of Eau Claire for permission to cross the Wisconsin Central tracks was granted. A long contest between the Wisconsin Central receivers and the electric company is thus practically terminated, and all obstacles to the completion of the electric line between Eau Claire and Chippewa Falls is removed.

FRANKFORT, KY.—The Frankfort & Suburban Ry. will probably be extended. The road operates 5½ miles of track. The Franklin County Grand Jury, at its recent session, censured the county officials for not compelling the trolley road to make certain extensions required by the terms of its franchise.

HELENA, MONT.—The Helena St. Ry. will build an extension, about five miles long, to East Helena.

HUDSON, N. Y.—Press reports state that the following gentlemen are interested in an electric railroad projected to run from Hudson to Philmont: Charles J. Cooper of Brooklyn, who recently bought the Hudson St. Ry., and the Hudson Electric Light & Power Co.; E. F. Foote of New York; J. L. Kirkland of Chicago, and H. W. Smith of the Bibber-White Co. of Boston.

KANSAS CITY, MO.—The Missouri Electric Ry. Co. is organized, with a capital stock of $500,000, one-half paid in, to build a double-track electric line, starting from Eleventh St. and Grand Ave., the center of the retail district, running south and east to the southern city limits on Prospect Ave., about seven miles, where it will connect with a line in Jackson County running south to Dodson, with a branch to Swope Park. Franchise for that part of the road in the county has been granted by the County Court to the Jackson County Electric Ry., which is controlled by stockholders of the Missouri company. The combined roads will be 12 miles long, double track. The company has other extensions under consideration. All matters relating to the construction and equipment of the road are being held in abeyance, pending the action of the City Council in the matter of application for a franchise inside the city limits. The office of the company is in the Baird Building, Kansas City, Mo., and the officers are: Henry Smith, President; F. W. Sears, Vice-President and General Manager; Chett McDonald, Secretary; B. F. Burd, Treasurer, and W. H. Brown, General Counselor.

Press reports state that the Directors of the Metropolitan St. Ry. Co. have taken steps to change all the cable lines to electricity.

LIMA, N. Y.—Press reports state that the Lima & Honeoye Falls Electric RR. is in operation. The road runs from Honeoye Falls to Lima, about 15 miles, where it connects with the Batavia-Canandaigua branch of the New York Central. Among those interested in this road are: Henry W. Box, William C. Warren, John C. Conway, George Urban, Jr., Peter P. Miller, C. E. Clark, Porter Norton, John E. Selkirk, all of Buffalo. (April 22, June 24; pp. 301, 467.)

LINCOLN, NEB.—The Lincoln Traction Co. is laying some double track and making other improvements, besides building an extension to Havelock, 2½ miles.

NEVADA, MO.—A special election was held Sept. 26 to vote on a proposition submitted by J. B. Quigley, formerly of Sedalia, to build an electric railroad in this city. The proposition carried almost unanimously. The enterprise will consist of an electric railroad connecting the Union depot, the State Insane Asylum and White Sulphur Springs Lake and Park; also the electric and gas lighting franchise for Nevada, and in addition an electric railroad from Nevada to El Dorado Springs, a distance of 23 miles, which road will carry both passengers and freight; also the electric lighting franchise for El Dorado Springs. Quigley & Co. have a large part of their material already on hand. It will cost $400,000 to build the system.

NEW YORK, N. Y.—The Metropolitan St. Ry. Co. began running electric cars regularly on Sixth Ave. Oct. 1, between Fifty-ninth St. and Fourth St. The work below Fourth St. will be pushed rapidly, and it is expected that within another month the whole route from Harlem to Vesey St will be open.

ONEONTA, N. Y.—The Oneonta & Otega Valley Ry. Co. has completed its line from Oneonta to West Oneonta. The road will be leased to the Oneonta St. Ry. The West Oneonta & Laurens road has been surveyed and right of way secured. Frank Gould is President of the three companies. (Dec. 31, '97, p. 937; Mar. 25, '98, p. 225.)

PALMER, MASS.—Negotiations have been begun for the extension of the Palmer & Monson St. Ry. from Thorndike northward to Ware, eight miles. The town officials of Ware held a hearing last week.

PROVIDENCE, R. I.—The Providence, Warren & Bristol branch of the New York, New Haven & Hartford is being double tracked from East Providence to Warren, and the intention is to put on an electric service between Fall River, Bristol and East Providence, running the same equipment over the Union Street Ry. Co.'s tracks to the new Providence station. The double tracking is nearly completed and the work of bonding the rails is under way. The equipment is not fully decided upon, but it is intended to complete the work, furnish the equipment and put it in operation as soon as it can be done conveniently.

ROCHESTER, N. Y.—The Rochester, Charlotte & Manitou RR. will probably build an extension to Hilton, four miles. The roadbed is being improved and new cars put on.

ROCKFORD, ILL.—The contract for building the Rock River Electric Ry. has been let, and it is expected that the road will be built from Rockford as far south as Byron, about 12 miles, this fall. The company confidently expected to place this contract last March. (Mar. 4, p. 171.)

SYRACUSE, N. Y.—The Syracuse Rapid Transit Co. is laying new tracks on Lexington and Westcott Sts. The company will soon double track and improve the Walnut Ave. division in College place and Euclid Ave. It has been decided to rebuild what is known as the Grace and Dudley division this fall, slightly changing the route.

At a meeting of the projectors of the Syracuse, Skaneateles & Moravia Electric RR., held in Syracuse lately, it was stated by Mr. Wing T. Parker, of Moravia, the President of the company, that the right of way is secured for all but about five miles of the 43 miles which it is proposed to build. The terminal facilities at Syracuse, he said, would cost about $200,000. It is proposed to do a general freight business.

WESTBROOK, ME.—Work has been begun on the first 10 miles of roadbed of the Westbrook, Windham & Harrison electric road. This section will be in operation by Nov. 1. (Feb. 25, p. 149.)

WORCESTER, MASS.—The Worcester & Webster St. Ry. Co. has been chartered. The proposed line is 15 miles long, from the city hall in Worcester through Auburn and Oxford to the post office in Webster. The capital is $150,000. The Directors are Julius Garst, E. L. Parker, G. A. Bigelow and F. P. Knowles, all of Worcester; E. S. Hill and H. S. Shaw of Webster and L. E. Thayer of Oxford. (Mar. 18, p. 209.)

GENERAL RAILROAD NEWS.

Railroad Earnings.

Showing the gross and net earnings for the periods ending at the dates named:

August.		1898.	1897.	Inc. or Dec.
Central of Georgia.				
1 month	Gross	$417,012	$382,259	I. $34,752
1 "	Net	113,415	107,218	I. 6,197
2 months	Gross	866,637	741,409	I. 125,228
2 "	Net	262,027	196,454	I. 65,573
Chicago, Burlington & Quincy.				
1 month	Gross	$4,054,595	$3,854,013	I. $200,582
1 "	Net	882,292	808,296	I. 73,996
2 months	Gross	7,140,792	6,897,072	I. 243,720
2 "	Net	914,367	1,024,302	D. 109,935
Denver & Rio Grande.				
1 month	Gross	$784,089	$684,736	I. $99,353
1 "	Net	329,955	285,238	I. 44,717
2 months	Gross	1,505,361	1,383,112	I. 122,249
2 "	Net	638,518	591,421	I. 47,097
Erie.				
1 month	Gross	$2,978,007	$3,181,791	D. $203,784
1 "	Net	953,002	963,165	D. 10,163
Lehigh Valley.				
1 month	Gross	$1,773,608	$2,011,174	D. $237,566
1 "	Net	576,781	693,549	D. 116,768
9 months	Gross	13,445,392	13,312,206	I. 133,186
9 "	Net	3,392,435	2,893,663	I. 498,772
Lehigh Valley Coal Co.				
1 month	Gross	$1,415,173	$1,581,035	D. $165,862
1 "	Net	*221,502	*34,870	I. 186,632
9 months	Gross	10,848,214	10,874,634	D. 26,420
9 "	Net	*815,942	*297,246	I. 517,696
*Net loss.				
Mexican National.*				
1 month	Gross	$500,799	$500,136	I. $663
1 "	Net	236,548	258,282	D. 21,734
8 months	Gross	4,045,225	3,988,686	I. 56,539
8 "	Net	1,832,339	1,944,284	D. 111,945
*Mexican currency.				
New York, Ontario & Western.				
1 month	Gross	$385,862	$386,827	D. $965
1 "	Net	129,051	121,774	I. 7,277
2 months	Gross	735,749	794,813	D. 59,064
2 "	Net	232,230	269,344	D. 37,114
Norfolk & Western.				
1 month	Gross	$945,228	$1,011,572	D. $66,344
1 "	Net	310,518	348,036	D. 37,518
2 months	Gross	1,810,499	1,903,980	D. 93,481
2 "	Net	578,635	613,846	D. 35,210
Philadelphia & Reading.				
1 month	Gross	$1,909,540	$1,888,537	I. $21,003
1 "	Net	839,840	853,455	D. 13,615
2 months	Gross	3,597,612	3,805,133	D. 207,521
2 "	Net	1,495,226	1,702,830	D. 207,604
Philadelphia & Reading Coal & Iron Co.				
1 month	Gross	$1,659,537	$2,128,095	D. $468,558
1 "	Net	101,234	108,395	D. 7,161
2 months	Gross	3,015,781	4,203,853	D. 1,188,072
2 "	Net	200,384	268,839	D. 68,455
Union Pacific.				
1 month	Gross	$1,584,831	$1,628,109	D. $43,278
1 "	Net	706,194	584,599	I. 121,595
2 months	Gross	3,070,641	3,027,290	I. 43,350
2 "	Net	1,352,750	963,241	I. 389,509
Wabash.				
1 month	Gross	$1,283,293	$1,218,181	I. $65,112
1 "	Net	381,544	447,855	D. 66,311
2 months	Gross	2,362,504	2,188,816	I. 173,688
2 "	Net	639,198	777,289	D. 138,091

BALTIMORE & OHIO.—The Advisory Committee, of which Louis Fitzgerald is Chairman, has announced a plan of reorganization for the consolidation of a number of the subordinate roads. The plan provides that the B. & O., as reorganized, shall acquire these roads, issuing its bonds in exchange for their existing securities, and to provide new capital for enlargement, betterment and extension of the properties. These bonds are to be known as B. & O. Pittsburgh Junction & Middle Division first mortgage 3½ per cent. gold bonds, falling due 1925, and to bear interest from Nov. 1, 1898; total authorized, $15,000,000. The right will be reserved to issue $5,000,000 additional, not to exceed $1,000,000 per year for the first two years, and thereafter not to exceed $500,000 per year, for the betterment of the properties covered by the mortgage. The syndicate formed for the reorganization of the parent road, consisting of Messrs. Speyer & Co., and Kuhn, Loeb & Co. of New York, and Messrs. Speyer Bros. of London, will purchase $4,000,000 of the new bonds and will issue in exchange for the old securities as follows.

Central Ohio: For each $1,000 4½ per cent. bond ($2,500,000 outstanding) $1,170 new bonds. For each $100 share of the old common and preferred stock ($2,483,060 outstanding) $100 new B. & O. preferred stock.

Sandusky, Mansfield & Newark: For each $1,000 7 per cent. bond ($2,300,000 outstanding) $1,140 new bonds. For each $100 stock ($842,800 outstanding) $100 new B. & O. preferred stock.

Columbus, Cincinnati & Midland: For each 4½ per cent. bond ($2,000,000 outstanding) $700 new bonds and $200 new stock. For each $100 of preferred stock ($1,000,000 outstanding) $30 new stock.

Newark, Somerset & Straitsville: For each $1,000 5 per cent. bond ($800,000 outstanding) $500 new bonds and $600 new stock.

Pittsburgh Junction: For each $1,000 first mortgage 6 per cent. bond ($1,440,000 outstanding) $1,300 new bonds. For each $1,000 second mortgage 5 per cent. bond ($300,000 outstanding) $1,100 new bonds. For each $100 preferred stock ($480,000 outstanding) $100 new bond, $60 new stock. For each $100 common stock ($1,400,000 outstanding) $75 new stock.

Pittsburgh Junction Terminal Co.: For each $1,000 5 per cent. bond ($500,000 outstanding) $1,080 new bonds.

Holders of the above bonds and stock are invited to deposit them with the Mercantile Trust Co., New York, on and after Oct. 7. Upon the completion of the reorganization, holders of certificates of deposit for the Sandusky, Mansfield & Newark first mortgage 7's will be paid in cash the matured and unpaid coupons on these bonds, but no cash payment will be made on account of the unpaid coupons on other bonds deposited, but upon the completion of the reorganization interest will be paid at the respective rates provided in the old bonds up to Nov. 1, 1898.

The reorganized B. & O. Co. will have securities as follows: Prior lien, $70,000,000; Pittsburgh Junction & Midland Division 3½ per cent. bonds, $15,000,000; first mortgage 4 per cent. bonds, $50,000,000, making a total of $135,000,000 in bonds. On these the interest charges will be $4,975,000, and the estimated rentals, taxes, etc., will bring the fixed charges up to $6,300,000. The net income of all the roads included in the proposed plan for the year ended June 30, last, was $8,296,433. On this basis the surplus, after the payment of the fixed charges, would be about $2,000,000.

Suits have been entered for the foreclosure of the B. & O. 6 per cent. mortgages of 1872 and 1874, each of £2,000,000 sterling, secured by mortgage lien on the main line. The semi-annual interest of $290,200 on each loan, due March 1, and May 1, respectively, was not paid.

Holders of Staten Island Rapid Transit first mortgage 6 per cent. bonds, due 1913, are requested to deposit them with the Investment Trust Co. of Philadelphia, that an order of the court may be secured compelling the receivers to pay the interest on these bonds and to secure the integrity of the first mortgage against the floating debt on the interest of junior securities. New York bondholders may deposit with Dick Bros. & Co. (Aug. 26, p. 618.)

BUFFALO, ROCHESTER & PITTSBURGH.—An official of this company states that trackage arrangements have been made with the Pittsburgh & Western for an entrance into Pittsburgh, Pa., over that line from Butler. No details, however, are given.

CENTRALIA & CHESTER.—The first mortgage bondholders have made application to the Farmers' Loan & Trust Co., trustees of the mortgage, for the immediate commencement of foreclosure proceedings. They charge C. M. Forman, Receiver, with gross mismanagement, including enormous and unnecessary expenditures. The Receiver has issued $425,000 of receiver's certificates and leave is asked to issue $125,000 more. It is alleged that the taxes and other obligations, for which a portion of the bonds was issued, are still unpaid. This line runs from Evansville, Ind., to Centralia, 61.5 miles. It went into the hands of a receiver June 7, 1897. (March 22, p. 225.)

CENTRAL VERMONT.—An agreement has been made by which all opposition to the immediate reorganization of the company will be withdrawn. The plan accepted by the first mortgage bondholders and the Grand Trunk will be carried out, with such modifications as will give the first mortgage bondholders par value in the new first mortgage 4 per cent. gold bonds. The interest will be guaranteed by the traffic contract with the G. T. (April 22, p. 301.)

CUMBERLAND & OHIO.—Circuit Judge Carroll, at Shelbyville, Ky., has handed down a final order in the case of the Germania Safety Vault & Trust Co. of Louisville, Ky., against the Northern Division of the C. & O., ordering the foreclosure and sale of the road at public auction. The upset price was fixed at $100,000. This road runs from Shelbyville southwest 26.7 miles to Bloomfield. It was recently incorporated as the Shelbyville & Bloomfield, and bought Dec. 13 last by the Southern Ry. (April 1, p. 248.)

DENVER, LEADVILLE & GUNNISON.—Holders of Union Pacific 4½ per cent. D., L. & G. bonds are notified that in accordance with the terms of the bondholders' agreement of Feb. 8, 1894, a meeting will be held at the office of Edward W. Sheldon, 45 Wall St., New York, Oct. 18, at 11 a. m., to receive a report from the reorganization committee, and to determine what disposition shall be made of the railroad and property embraced in the first mortgage. (Aug. 26, p. 620.)

LAWRENCE & EMPORIA.—Judge Hazen, at Topeka, Kan., Sept. 22, annulled the charter of this company, and authorized the Receiver, Hiram P. Dillon, to sell the property. The line runs from Lawrence, Kan., to Emporia, and the capital stock is owned by the Union Pacific. It went into the hands of a receiver March 13, 1893. The line was abandoned March 22, 1894. The suit to annul the charter was filed Oct. 6, 1897.

LEAVENWORTH, TOPEKA & SOUTHWESTERN.—D. W. Mulvane, appointed Special Master to pass upon the intervening petitions in the foreclosure suit against this road, has filed a report in the Federal Courts. In this he recommends that the intervening petitions be made prior liens on the property, to be paid either by the receiver or out of the proceeds of the sale of the road. The claims are as follows: Union Pacific Receivers, $12,663, with interest at 6 per cent. from January, 1894; Leaven-

worth Depot & Ry. Co., $959, for depot rental at Leavenworth; Fort Worth & Denver City, $64 for repairs. This report clears up all details of the foreclosure and opens the way for an order of sale. (Aug. 20, 1897, p. 596.)

MISSOURI, KANSAS & TEXAS.—Suit was brought in the United States Circuit Court last week by holders of $5,000,000 4 per cent. second mortgage gold bonds, to remove the Mercantile Trust Co. as trustee of the $20,000,000 issue of these bonds. The bonds were issued in 1889, and were to bear interest beginning June 1, 1890. The complainants allege that the Mercantile Trust Co. has failed to pay interest since that date, which has now accumulated to $2,400,000. The Mercantile Trust Co. on Feb. 10, 1892, filed a complaint against the railroad company that the net earnings were applied to other purposes than the payment of the coupons of these bonds. (June 10, p. 442; June 24, p. 468.)

NEW YORK CENTRAL & HUDSON RIVER.—Thos. Hitchcock of New York City, a stockholder in the New York & Harlem, has followed up his protest to other stockholders by beginning an action in the Supreme Court against the Directors of the N. Y. & H. Co. to restrain them from surrendering to the N. Y. C. & H. R. Co. $220,000 out of the $420,000 a year which will be saved by refunding the old $12,000,000 consolidated 7 per cent. mortgage for the new 3 per cent. mortgage. (Sept. 30, p. 716.)

NORTHERN PACIFIC.—Special Master Carey has filed a decision in the United States Court at Milwaukee, Wis., wherein it is shown that there is still due from the old company $86,292,682, with interest from Sept. 1. The only tangible assets of the old company, were 3,738,874 acres of land in North Dakota and Minnesota, which are now in the hands of the receivers, and are valued at not more than $18,000,000. If the decision is upheld, the company will receive 90 per cent. from the proceeds of these lands. (Sept. 2, p. 640.)

Holders of N. P. RR. and land grant general first mortgage sinking fund 6 per cent. gold bonds, are notified that the company will convert the same into new prior lien 4 per cent. bonds on the basis of $1,150 new bonds for each $1,000 of the old bonds. Accrued interest on the old bonds from Jan. 1 to Oct. 1 will be paid in cash at the time of conversion. (Feb. 11, p. 112.)

OREGON SHORT LINE.—The Treasurer announces that on and after Oct. 1, interest on the income "B" bonds will be paid at the rate of $30 on $1,000 bonds, and $15 on each $500 bond, upon presentation of coupons at the office of the State Trust Co., New York, or at the office of the railroad company, Boston.

PACIFIC ROADS.—The option granted to holders of Pacific Roads bonds, becoming due Dec. 31, 1898, to receive payment in full, with interest less a rebate of one-half of 1 per cent. upon the face value of the bonds, terminated with September, but the United States Treasury Department has extended the option through the month of October. Out of $14,004,560 outstanding, only $846,000 has been presented. (Sept. 9, p. 657.)

ST. LOUIS, CHICAGO & ST. PAUL.—On Oct. 1 the Mercantile Trust Co. and Louis Fitzgerald of New York, trustees of the first mortgage bondholders, applied to the United States Circuit Court at Springfield, Ill., for foreclosure of the first mortgage of $1,500,000, and for the appointment of a receiver, on the ground of default in interest payments. Judge Allen appointed as receiver Col. Wm. H. Male, a director of the road, with a bond of $25,000. This line runs from Springfield, Ill., to Granite City, 102.1 miles, with a branch to Grafton, 8.4 miles. It is successor to the St. Louis, Alton & Springfield, which went into the hands of a receiver June 13, 1893, and was sold April 3, 1897, to the new company, which took possession June 1, following. (Jan. 14, p. 36.)

SOUTHERN.—This company has filed amended articles of incorporation in Kentucky, changing the time of the annual meeting for the election of directors from the Tuesday preceding the last Tuesday in October to the Tuesday preceding the first Wednesday in October.

TEXAS & PACIFIC.—Holders of trust mortgage bonds on the Eastern Division of May 15, 1875, are notified that 438 of these bonds have been drawn for payment at the Mercantile Trust Co., New York, at par value, in accordance with the terms of the mortgage, on or before March 1, 1899.

UNION PACIFIC, DENVER & GULF.—Official announcement is made of the proposed reorganization which is to take place under the name of the Colorado & Seaboard Ry. The new company will issue $20,000,000 of new 4 per cent. gold bonds, interest payable semi-annually, and the principal maturing Feb. 1, 1929. This includes $2,250,000 for coal properties and for additional improvements. There will also be issued $8,500,000 non-accumulative 4 per cent. first preferred stock, an equal amount of 4 per cent. second preferred stock, and $31,000,000 of common stock. All classes of the new stock are to be fixed under the following voting directors: Grenville M. Dodge, Frederic P. Olcott, Harry Walters, Henry Budge and J. Kennedy Tod.

A syndicate has been formed which will take the following new securities when issued: $2,010,750 of the first mortgage bonds; $2,551,499 of the first preferred stock; $2,321,499 of the second preferred stock, and $30,429,982 of the common stock. The new securities are to be offered for sale as follows: $760,750 first mortgage bonds; $1,521,499 of the first preferred stock, a like amount of the second preferred stock and the entire issue of the common stock. These will be offered to depositing holders of the stock of the Union Pacific, Denver & Gulf and the Denver, Texas & Fort Worth for the aggregate sum of $3,042,998. The committee is to pay the syndicate for the benefit of the several syndicate subscribers, in proportion to their respective subscriptions, a commission of $390,000 in cash, besides a commission of $80,000 for the management of the syndicate.

Holders of certificates of Central Trust Co., under the plan of agreement Sept. 18, 1897, from the Central Trust Co., will be entitled to the benefits of the plan without the issue of new receipts or certificates, and holders of these bonds who have not deposited them, may become entitled to the benefits by depositing on or before Oct. 25. Holders of certificates of deposit under the agreement for the first mortgage bonds of the Denver, Texas & Gulf, and for first mortgage bonds, and for funded interest 5 per cent. certificates of the Denver, Texas & Fort Worth, must surrender the same to the depositary before Oct. 25 and obtain new certificates for the same. Holders of stock in the three old companies can obtain new stock certificates by depositing the same on or before Oct. 25 and paying $10 per share. These payments are to be made in two equal installments at the office of the depositary in New York, or at its agency in Boston, and must be completed before Nov. 28. The various committees of the three companies publicly announce their acceptance of the terms of agreement.

WHEELING & LAKE ERIE.—The Mercantile Trust Co., as trustee for the first mortgage (Lake Erie Division) bonds of July 11, 1886, gives notice that the coupons upon these bonds due Oct. 1, will be paid upon presentation at the office of the company, New York. (Sept. 23, p. 698.)

Electric Railroad News.

BROOKLYN, N. Y.—Albert L. Johnson, President of the Nassau Electric RR. Co., is quoted as saying:

The consolidation of the Nassau with the Brooklyn Heights road (capital stock of which is owned by the Brooklyn Rapid Transit Co.) will probably be accomplished within two weeks. P. H. Flynn and my brother and I own one-third of the stock of the Nassau and the Wilsons own nearly two-thirds. I shall either sell my stock, or I shall retain it and resign as President of the Nassau. I believe the motive behind this deal is the hope to consolidate all the railroad interests, both surface and elevated. If such a deal were carried out, then the surface cars could carry all the short distance traffic, while the elevated roads could run express trains from terminal to terminal, making but one or two intermediate stops. Passengers under such a system could be transferred from the surface to the elevated, or vice versa, and by the increased speed of the elevated trains Brooklyn would have real rapid transit. I believe that eventually we shall come to that, as the interests of the companies and the public both demand it.

NEWBURYPORT, MASS.—W. F. Clark of Peabody was appointed receiver of the Newburyport & Amesbury Horse RR. Co., upon application of the Mechanics' Savings Bank of Providence, which holds $25,000 of the company's bonds, on which the September interest was defaulted.

NEW ORLEANS, LA.—Press reports state that the Louisville Committee appointed to arrange for the reorganization of the New Orleans Traction Co., Ltd., announce that all arrangements are practically completed. The company owns the New Orleans City & Lake RR. and the Crescent City RR. It has been unable to meet its fixed charges, which amount, it is said, to $600,000 a year. By the new plan the two systems will be combined and expenses reduced considerably. The stockholders will raise $300,000 to pay off the floating debts, getting preferred stock in return. The capitalization will be reduced. The common stock is now $500,000 and the preferred $2,500,000.

NEW YORK, N. Y.—The Third Avenue RR. closed its transfer books Oct. 4 for the purpose of ascertaining the stockholders who are entitled to subscribe to the second issue of the increased capital stock, amounting to 20,000 shares ($2,000,000), pursuant to resolution of the Board of Directors adopted Sept. 19. The company in 1896 authorized an increase of $3,000,000 in the capital stock. Of the new shares the first issue, $1,000,000, was made in September, 1896, and now the remainder is to be sold, making the total capital stock $12,000,000. The work of installing the underground trolley system, it is understood, will be begun shortly. According to reports a plan is proposed for merging the Third Ave. RR. and its subsidiary roads into a new corporation with greatly enlarged capital. These subsidiary companies are the Union Ry., whose entire capital stock was bought by the Third Ave. January, 1898; the Dry Dock, East Broadway & Battery RR. Co., capital stock owned; the Forty-second Street, Manhattanville & St. Nicholas Ave., controlling interest bought by the Third Ave. in 1895.

PADUCAH, KY.—The Paducah St. Ry., Power & Light Co. has filed a trust deed with the County Clerk in favor of the American Trust & Savings Co. for $400,000. This was done to enable the street railroad company to issue additional bonds, if desired.

PETERBOROUGH, ONT.—The Peterborough & Ashburnham St. Ry. was recently sold at Sheriff's sale to Messrs. Hazlitt, Bradburn and Stevenson and the Walsh estate for $20,000. The buyers were members of the company and held judgments against the road for $50,000.

QUINCY, ILL.—The Quincy St. Ry. Co. has filed a mortgage for $500,000 in favor of the Portland Trust Co. to secure an issue of bonds for the same amount.

ROCKFORD, ILL.—Press reports state that foreclosure proceedings have been instituted by the Northern Trust Co. of Chicago, against the Rockford Traction Co. for $200,000. It is understood that the trust company represents the bondholders, who expect by the present proceedings to have some of the obstacles in the path of a legal consolidation with the City Railway Co. removed. The City Council will take up the consolidation ordinance at its next meeting and probably eliminate some of the features which are objectionable to the company and which it refuses to accept. (July 22, p 540.)

SYRACUSE, N. Y.—John H. Moffit has resigned his position as General Manager of the Syracuse Rapid Transit Co.

TRAFFIC.

Traffic Notes.

The railroads of Texas have yielded to the inevitable and accepted the Commission's emergency rate of 3 cents on canned goods.

For three disappearing gun carriages recently sent from Bethlehem, Pa., to Seattle, Wash., the Government paid freight at the rate of 132.4 cents per 100 lbs. Each carriage weighs about 100 tons. The contract was made by the Chicago & Northwestern.

The appeal of the Pennsylvania and the New York Central on the question of differential fares has been dismissed by the Board of Arbitration of the Joint Traffic Association on the ground that the Board has no authority to decide the case on its merits.

The North Carolina Railroad Commission recently ordered passenger rates reduced on the Wilmington & Weldon, from 2¾ to 3¼, to 2 and 2½ cents. Last week the Commission rescinded the order, in so far as it affects any portion of the road except that between Wilmington and Weldon, the principal portion of the main line.

The Manager of the reorganized Chicago Car Service Association is Mr. Sanford, heretofore Manager of the Missouri Valley Car Service Association at Kansas City. The Association will have control over all territory inside the line of the Elgin, Joliet & Eastern and all stations on that road, except Joliet and Aurora.

The Canada Atlantic, with its boat line from Chicago and Duluth to Parry Sound, is still moving large quantities of grain for export to Europe. Large quantities of flaxseed for export to Europe have been delivered at Parry Sound by vessels from Toledo, O., and it is said that the road has contracted to carry 300,000 bushels of flaxseed.

A charter for grain to England was made in New York last week at 4s. 4d. per quarter (8 bushels), which indicates an increase of about a shilling a quarter, or three cents a bushel, from the rates which have prevailed for several months past. Ocean rates have also advanced at Galveston and cotton shippers have had difficulty in getting vessel room.

On Sept. 28 the Erie road announced in Buffalo a reduction in the passenger fare to New York of $2, from $8 to $6. This is said to be the outcome of secret reductions which have been going on for some time. The new rate was met by the Lehigh Valley, but on the next day it was announced that all of the roads had agreed to restore fares to tariff rates, beginning Oct. 1.

A Toledo newspaper reports that buyers of soft coal in large quantities get it delivered in that city at $1.79 a ton, which is about 32 cents below the normal price and is supposed to indicate a secret cut in freight rates of about that amount from points in the Hocking Valley. The various roads delivering Ohio coal at Lake Erie ports have an agreement to maintain rates, but it is believed that secret reductions have been common for some time.

The Grand Trunk is laying about 15 miles of side tracks at Portland, Me., to accommodate the export grain traffic, which has largely increased of late. The Leyland Line of steamships now takes the principal part of the export grain brought to Portland by the Grand Trunk, and it is said that this line will, next summer, run vessels to and from Montreal. The Grand Trunk is receiving considerable quantities of grain from Duluth at Midland, its port on Georgian Bay, about 50 miles south of Parry Sound. The 100,000 tons of steel plates which the Illinois Steel Company is sending to Ireland are going over the Grand Trunk.

Chicago Traffic Matters.

Chicago, Oct. 5, 1898.

Freight rates from Chicago to all points are in better shape than they were a week ago. The meeting of the executive freight officers of the eastbound lines has had a good effect on the local men, and there seems to be decided inclination to stick close to the printed tariffs. Between Chicago and St. Paul rates, particularly freight, are in a rather weak condition.

Passenger rates to Omaha have been and still are in a demoralized condition. The warm competition for the big parties that went from here last week stirred things up, and it is not believed that anything like the agreed rates will be again in effect until the show closes.

General passenger agents say that the joint agency established at Cincinnati for handling tickets to the G. A. R. encampment was highly successful. The report of the agent in charge of bureau shows that but few of the tickets found their way into scalping shops. The proportion of return tickets vised by the joint agent was larger than during any previous gathering of like magnitude.

All the Chicago lines have agreed to make a round trip rate of one fare to Chicago for the peace jubilee, Oct. 18 and 19. The tickets will be sold from all points within a radius of 250 miles of the city.

Chicago scalpers have been getting half-rate tickets by sending around to the railroad offices a man in soldier's clothing, carrying furlough papers, presumably fraudulent. The officers of the Central Passenger Association advise all roads to indorse soldiers' half-rate tickets "Good only for soldier or sailor in uniform." The furlough paper should be indorsed in ink with a description of the ticket issued on it.

The lake rate on grain, Chicago to Buffalo, has for some days been firm at 1¾ cents a bushed, the highest price of the season.

Eastbound shipments of flour, grain and provisions from Chicago and Chicago junctions to and beyond the Western termini of the Trunk lines for the four weeks ending Sept. 29 amounted to 153,738 tons, as compared with 156,788 tons for the corresponding period of last year. This statement includes 18,596 tons of flour, 70,479 tons of grain, 64,663 tons of provisions. The following table shows the quantities carried by the respective roads:

	Tons.
Baltimore & Ohio	7,849
Big Four	11,670
Erie	22,858
Grand Trunk	15,039
Lake Shore	13,931
Michigan Central	16,354
New York, Chicago and St. Louis	19,89[illegible]
Pittsburgh, Cincinnati, Chicago and St. Louis	15,32[illegible]
Pittsburgh, Ft. Wayne and Chicago	11,07[illegible]
Wabash	13,647

Eastbound shipments from Chicago, as reported weekly by the Board of Trade, for the four weeks ending Oct. 1, amounted to 216,642 tons. The statements of freight shipped eastward from Chicago are made up on two bases. The first statement given above is that furnished by the Chicago Freight Committee. It covers only three principal classes of freight, and it includes only such shipments as are carried through to Buffalo, Pittsburgh, Wheeling, etc.; but it includes shipments from all junctions in Cook County and from some other points, including all from the Elgin, Joliet & Eastern Railroad. The second statement does not include shipments from the junctions outside the city, but it does include practically all kinds of freight except live stock; and it shows the total shipments by the roads mentioned to all points, both through and local. The Freight Committee's statement is made up each week to Thursday night, while the Board of Trade's statement is made up to Saturday night.